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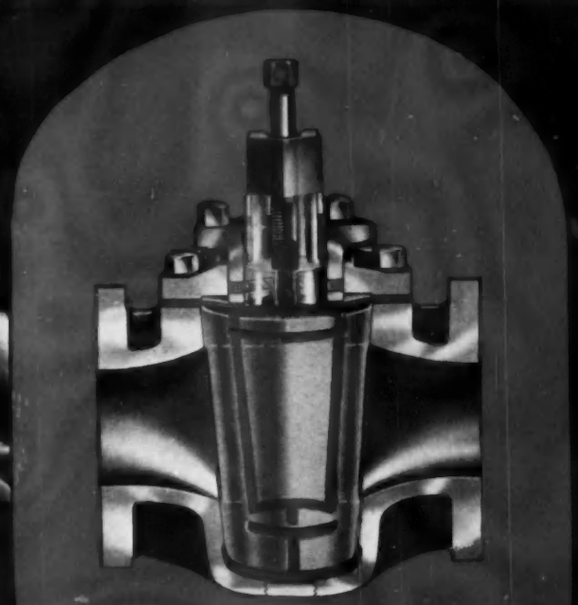

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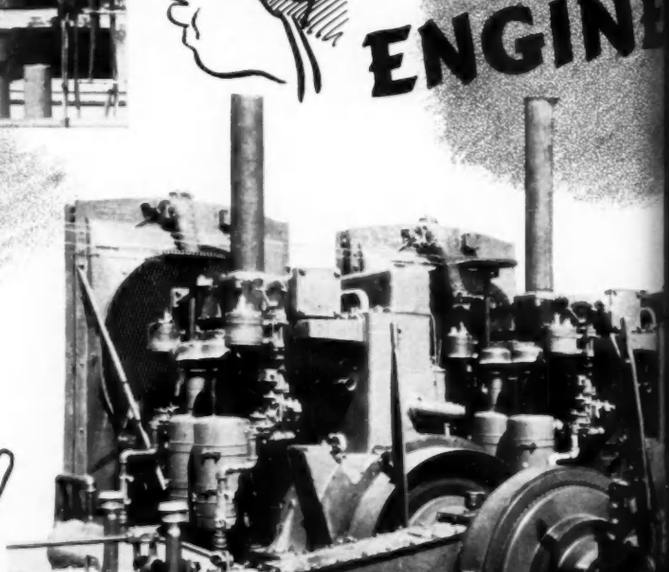

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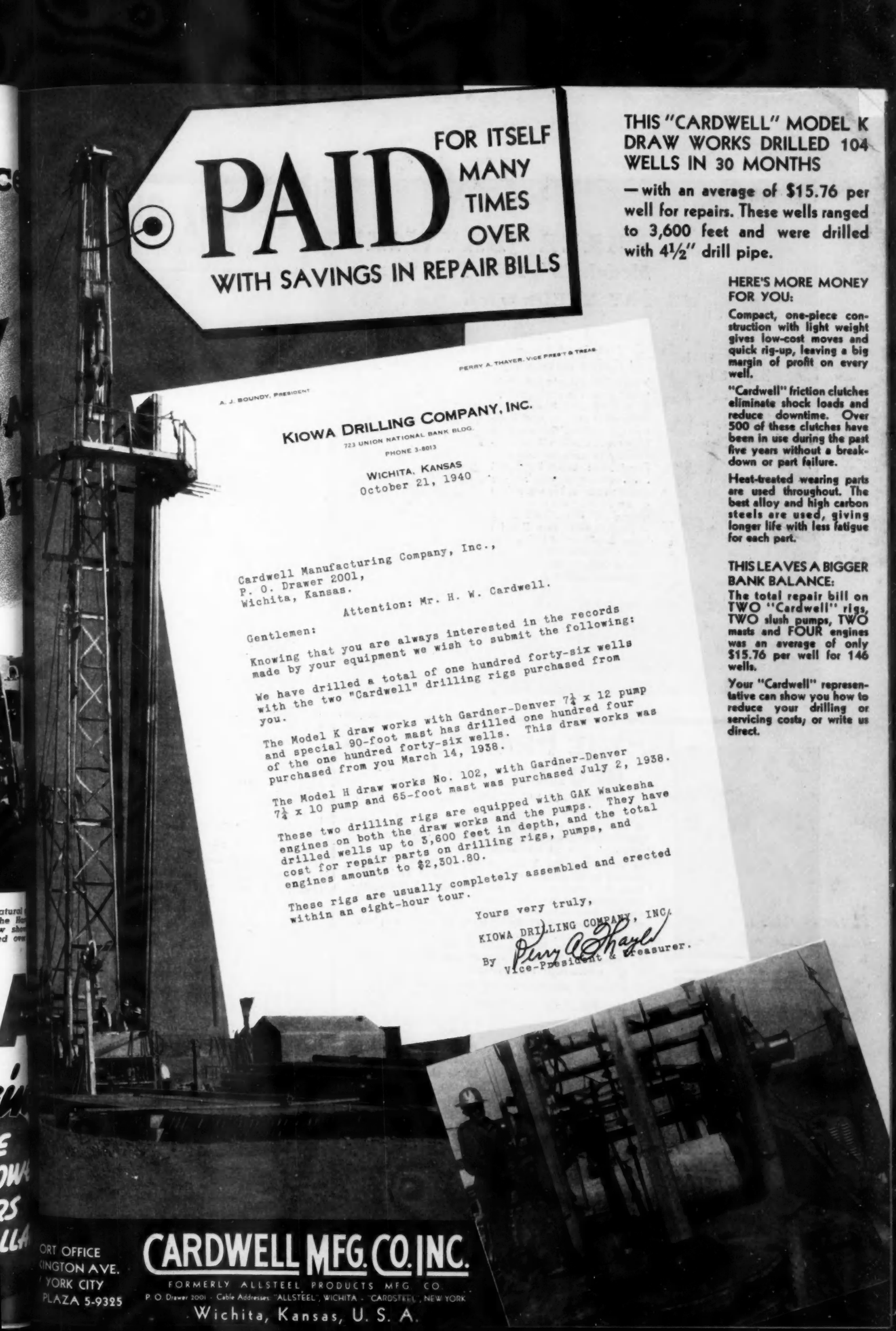

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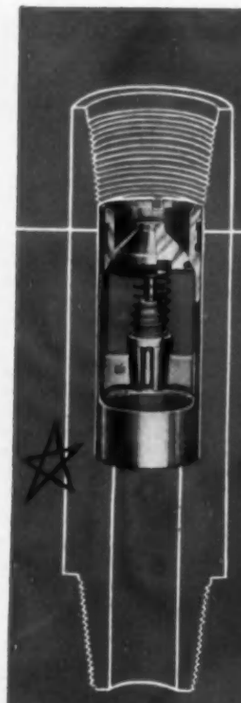

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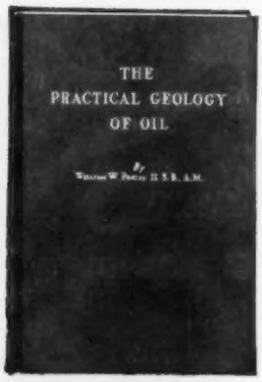

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Looking Ahead
WITH THE EDITOR

COMMUNICATIONS with scattered operations has been an important problem of the industry since it first attained manhood. As drilling and producing activities spread to new regions, the problem of keeping in close touch with these developments has presented an ever-increasing difficult condition. Unlike other mining industries, oil operations are not stationary, but are moving constantly. Moreover, it is essential that a constant check be maintained; for delays during troublesome drilling periods may necessitate the junking of a hole that has cost from $50,000 up.

In Marine Areas

More recently, the problem has been aggravated by drilling in water-covered areas. This is especially true in the swampy coastal fringe and open waters of the Texas-Louisiana Gulf Coast district. Here the usual land telephone was out of the question, and at first boats were the only means of communication. Because such locations frequently were two hours or more from land, a highly undesirable condition arose.

But now, thanks to modern scientific advancements, it is possible to communicate with inaccessible water locations with the same ease that a telephone call can be made within the limits of a city. The marine radio telephone has proven the answer to the problem, and is being applied to the needs of the industry.

With all the ease of completing a regular phone call, the operator of a boat or drilling barge may call district, division or company headquarters, supply houses, service company, etc. The radio telephone may be the direct or indirect means of large savings. The systems being used by oil companies are to be described in an early article.

The OIL WEEKLY, published every Monday. Entered as second-class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879.

THE OIL WEEKLY

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The Oil Man's Calendar

DEC. 16	Mid-Continent Oil & Gas Association, Annual Meeting of General Board of Directors, Tulsa Club Roof, Tulsa.
26-28	Geological Society of America, Austin, Tex.
1941 FEB. 22	North Texas Oil & Gas Association, Wichita Falls.
24-25	Liquefied Petroleum Gas Association, Chicago.
27-28	American Petroleum Institute, Division of Production, Southwestern District, Shreveport.
MAR. 11	American Petroleum Institute, Division of Production, Spring Meeting, Pacific Coast District, Los Angeles.
APRIL 2- 4	American Association of Petroleum Geologists, Twenty-sixth Annual Meeting, Houston.
17-18	American Petroleum Institute, Division of Production, Eastern District, Pittsburgh.
23-25	Petroleum Industry Electrical Association, Tulsa.
23-25	Natural Gasoline Association of America, Dallas.
25-26	National Petroleum Association, Cleveland.
25-26	Petroleum & Natural Gas Conference, State College, Pa.

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THE OIL WEEKLY

DECEMBER 16, 1940

VOLUME 100 NUMBER 2

The Changing Panorama

War Damage Slight . . .

Coupled with reports that bombing of oil refineries in Europe and Asia Minor have been strangely ineffective, comes an additional report which says that Germany is now exporting 8500 tons of petroleum or synthetic fuels monthly to Sweden, France and Spain.

This report of German exports says that Germany has been extremely active in increasing the production of the Polish fields, taken over with the fall of Poland last year. Germany also is reported to have discovered at least one new oil field within Germany since the war began. However, it is synthetic fuel production which is regarded as responsible for the bulk of Germany's aviation and motor fuels.

Plants in France, Germany, Syria and Bahrein, which have been, in some instances, repeated targets of bombing planes, are reported to have had astonishingly small damage. One plant, which has been reported bombed at least a dozen times, is said to have suffered the loss of only two storage tanks, while the refinery itself has continued its operations with its production unaffected. The long-range bombing of the Bahrein plant caused no damage, while the damage on the Arabian mainland, inflicted on the 2800-mile round-trip bombing expedition of the Italians, was confined to the breaking of an oil line which required only a few minutes to repair.

Russian Machinery . . .

Heavy orders of American oil country equipment have been placed in Russia during the past twelve months, the orders running into the millions of dollars. The United States government has apparently been disposed in a very kindly manner toward facilitating these shipments. This disposition to aid the shipments, however, was strongest before the recent visit of the USSR Foreign Commissar to Berlin.

Whether or not the same kindly feeling will prevail in the future remains to be seen. It is regarded as possible that developments which may occur in Europe within a very short time might conceivably have a material effect on the movement of unshipped orders from this country to Russia.

Oil for Busy Nation . . .

Recent good volumes of sales by the oil companies promise to be extended. Christmas business will shatter all previous records and be accompanied by large consumption of petroleum products. And demand for oil will continue heavy in 1941, with the defense program stimulating employment, consumer buying power, and business in most lines.

Industry in the United States already is operating at close to capacity, and it cannot further expand greatly until new defense plants and factories go into production. But industrial and commercial activity likely will expand to unprecedented proportions in the latter part of 1941.

Employment is expected to increase by 3,000,000 to 4,000,000 in the coming year, and larger farm income is anticipated. Construction activity will be brisk, and the railroads will be exceptionally busy, hauling goods of all types.

In these circumstances, business profits will be larger than ever before in all history, in the opinion of some qualified business analysts.

Cost of Defense . . .

Some comfort has been gained in the United States from indications that sharply higher national income will provide materially larger governmental revenue and prevent the public debt from rising too precipitously despite the heavy defense expenditures.

Whereas the country's income for 1940 is estimated at $74,100,000,000, compared with $70,000,000,000 in 1939, that for 1941 is expected to be about $83,600,000,000, or a little over the $82,885,000,000 of 1929.

On the basis of expenditures in the current fiscal year, including $7,000,000,000 for ordinary purposes and $5,000,000,000 for national defense, a national income of $90,000,000,000 a year would balance the budget, with current tax rates in effect. Income of $80,000,000,000 would raise $10,000,000,000, or about $2,000,000,000 less than the amount needed to balance the budget.

Larger Public Debt . . .

While the national defense program of the United States is adding in large extent to the public debt, countries at war naturally are piling up debt even more sharply. In the first year of the war, Germany's disclosed debt was increased 77.8 percent, from RM29,117,000,000 to RM66,542,000,000. Italy's huge military expenditures have led to sharply increasing budget deficits. Japan's public debt on September 30 was 25,622,000,000 yen, compared with 19,854,000,000 yen a year previously.

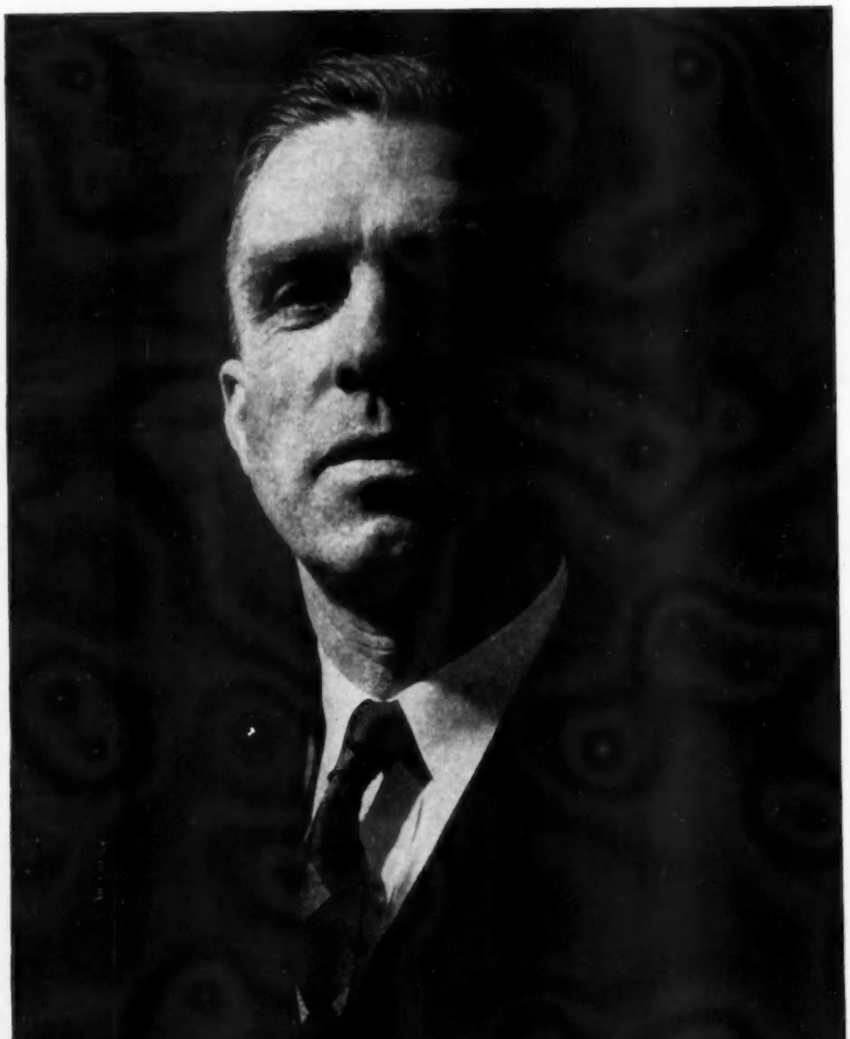
Petroleum in Mexico . . .

Petroleum and petroleum products account for about 10 percent of all Mexico's exports, and in the aggregate they rank fourth among the exports in value, coming after silver, gold, and lead, but ahead of zinc and copper.

Automobiles rank first among Mexico's imports, and they are followed by trucks, rayon, copra, iron machinery parts, iron and steel sheets.

Mexico has been selling about 74 percent of its total exports to the United States, on the basis of value, and has been importing from the United States about 66 percent of its total takings from other countries.

Wider Well Spacing—



S. K. CLARK has contributed to the *Journal of Geology*, and to several publications of the American Association of Petroleum Geologists, his papers including the results of considerable research on logging rotary wells from drill cuttings.

He was born in Dubuque, Iowa, attended Council Bluffs high school, and was graduated from the University of Nebraska with a B. S. in civil engineering. Following graduation he served in the United States Army as a pilot in the air service.

From 1919 until 1924, Clark was associated with several oil companies in Oklahoma and Kansas, joining the present Continental organization on July 1, 1924, as geologist. He was made assistant chief geologist for the company in 1932.

A CONSPICUOUS effect of proration has been the persistent decline of average well allowables in prorated areas. The resulting decline in revenue per dollar invested has been, and continues to be, one of the most serious problems confronting the oil producer.

Wider well spacing has been advocated strongly as a solution for the problem of declining allowables and has been adopted widely on the premise that it does constitute a solution.

The primary purpose of this discussion is to deny the validity of that premise. It will be shown that the arguments advanced in support of that theory are unsound and the conclusions untenable; that the promised benefits from its application have failed largely to materialize in practice; and that rejection of the theory is a necessary first step toward any real solution.

The economics of proration also are discussed briefly, and certain suggestions advanced as to possible constructive changes in its mechanism.

Discussion

The fact that allowables have declined persistently under proration is recognized universally. It constitutes the starting point and the basic reason for most of the present day arguments in favor of wider well spacing.

The following figures, based on one company's experience, are cited therefore simply to emphasize the magnitude of the decline rather than as evidence of its occurrence:

DAILY AVERAGE WELL ALLOWABLE

	1034	1935	1936	1937	1938	1939
West Kansas ..	160	120	78	52	30	25
New Mexico....	180	140	102	83	57	49

The theory that wider spacing offered a solution, for the problems thus created, was advanced shortly after the decline first became apparent. It gained adherents rapidly, and they have maintained an almost continuous barrage of

Panacea or Delusion?

By S. K. CLARK
Assistant Chief Geologist, Continental Oil Company

THE PERSISTENT DECLINE of per well allowables under proration is due to excessive overall rate of development, and it does not matter whether wells are drilled on 10, 20 or 40-acre tracts. Therefore, advocation of wider well spacing as a solution for the problem has been erroneous. Furthermore, actual field practice has shown that the overall drilling rate is stimulated by use of wider spacing instead of being reduced.

Thus does the author of the accompanying article summarize his views on the perplexing and acute problem of declining per well allowables and the often suggested remedy of wider well spacing.

He declares that the industry's first step in a constructive approach to the problem should be a reduction in drilling rates rather than a decrease in well density, and suggests that allowables be graduated on a basis of the age of the field so as to place the restraint where it is needed most — on unnecessary new development.

propaganda in its favor over a period of several years.

That campaign has been effective. Widespread acceptance of its arguments undoubtedly has been responsible for the adoption of proration regulations favoring wider spacing; the formulation of company policies directed toward that end; and a consequently increasing adoption of wider spacing units throughout the industry.

Forty-acre spacing is standard in New Mexico. Twenty-acre spacing predominates in Texas drilling, and two-thirds of the wells drilled in Kansas during the first seven months of this year were on twenty-acre units. Kornfeld[1] refers to the latter fact as evidence of the increasing popularity of wide spacing.

Since policies and acts of vital importance to the welfare of the industry are being predicated on the assumption that increasing the distance between wells will tend to halt the decline of well allowables, a critical examination of the arguments on which that assumption is based is in order.

The standard "wider spacing" argument follows an invariable pattern. Boiled down to its essentials, it goes like this:

"Declining allowables are due to too many wells.

"Wider spacing represents the ideal solution; since doubling the number of acres per well will cut the number of wells in half; reduce development costs proportionately; leave more oil available for the wells drilled; and thus insure profitable operations."

That really constitutes the entire argument, although it is customary to slide over it without elaboration or proof and move on to a detailed discussion of the "savings" and other benefits to be derived. Presumably the basic propositions are so simple that no proof beyond the mere statement is necessary.

Actually, the whole argument is over simplified to such an extent that the conclusions are worthless. The initial statement, for instance, that declining allowables are due to "too many wells," is too simplified to be a correct analysis of the problem. It may be admitted that unsatisfactory allowables at any given date are due to too many wells (in total, not per lease or per quarter section); but the phrase is meaningless except as to a specified point in time. A total which represents too many wells today would not necessarily be too many a year later.

A time factor is also inherent in the term "declining allowables" since a decline can only occur with the passage of time.

It is the changes in the totals of

[1] Kornfeld, Joseph A., "Major Economies Result from Adopting of Twenty-Acre Well Spacing in Western Kansas," The Oil Weekly (September 2, 1940).

completed wells through successive increments of time that are responsible for the decline, and the true statement is that the declining allowables are due to an *excessive rate of development.* A simple illustration will serve to demonstrate the truth of that statement.

Assume that there are 4000 prorated wells with an average allowable of 60 barrels per day. For the sake of analyzing the effect of the rate development, assume that the amount of 240,000 barrels per day available for prorated wells remains constant. Assume further that 50 wells per month pass into the unprorated class due to natural decline. Then it is obvious that development can be carried on at the rate of 50 completions per month without changing the average allowable; but if the rate is stepped up to 75 completions a month, by the end of a year the average allowable will have declined to 55+ barrels.

Furthermore the decline will continue, as long as the excessive rate of development is maintained, regardless of whether the wells are drilled on 10, 20, or 40-acre tracts. Time, rather than acreage, is the critical factor; and there is no magic whereby the effect of an excessive rate of development can be diminished in the slightest degree by spreading the wells out over a wider area.

Examination of the next step in the usual wider spacing argument, that is, the conclusion that wider spacing means fewer wells and consequently solves the problem of declining allowables, discloses the fact that the essential element of time has again been ignored completely.

It may be granted that wider spacing will ultimately mean fewer wells on a given lease or field. But the problem has been demonstrated to be one of rate, rather than density, of development. Consequently, that conclusion could be valid only on the assumption that widening the spacing would automatically bring about a proportionate decrease in the rate of development. That is exactly the same as arguing that a rate of traffic flow of 100 cars an hour would automatically drop to 50 cars an hour if the width of the road were doubled.

In other words, there is no connection between well spacing, as such, and rate of development. Instead of automatically declining, the rate of development may increase with the adoption of wider spacing, if that is coupled with an advantage in allowables. The fact must be recognized that in a given period of time, the drilling of four wells on each of two leases has exactly the same effect on average well allowables as the drilling of eight wells on one lease.

The foregoing analysis makes it clear that the entire argument for wider spacing as a solution for the problems of declining allowables, rests on a foundation consisting of:

1. A careless and incorrect statement of the problem.
2. A non sequitur conclusion that well density affects rate of development.

Since neither of them will stand up, the whole structure collapses, and the highly touted panacea is revealed as a complete and total delusion.

Detailed discussion of the postulated "savings" is therefore unwarranted; but it is in order to point out that the demonstrable savings are usually in ultimate cost per acre developed, rather than in the cost per barrel of allowable production developed. They may or may not be desirable, depending upon the ability of the spacing adopted to provide adequate drainage of the particular reservoir involved. Estimated savings in the cost per barrel of reserves developed are usually based on the assumption that acre yield is independent of well spacing, so they are hardly to be classed as demonstrable.

The anticipated benefits from the application of wider spacing have failed notably to appear in practice. If the theory were sound, some benefit should result from its application in any degree. Yet after years of increasing use of wider spacings, allowables in Texas, for example, have continued to decline until it has been necessary to splatter the calendar with shut-down days to maintain the fiction that wells are not being prorated below the minimum specified by law.

Kornfeld makes the claim that the decline of Kansas allowables has been checked, and indirectly, that wider spacing reduces the rate of development, in the following words:

> "Obviously 20-acre spacing and its widespread adoption has checked materially the decline in the per well allowable through the saving of 715 wells during the 11th month period dating from August 1939."

The implication is clear that 715 more wells would have been drilled during that period but for the adoption of 20-acre spacing; in other words, that the rate of completions was reduced as the result of the introduction of a productivity factor based directly on acreage (up to a maximum of 20 acres) into Kansas proration regulations in September 1939.

Actually there is nothing in the statistics to warrant any such implication. Kansas well completions by months for 1938, 1939, and the first six months of 1940 are tabulated below:

KANSAS WELL COMPLETIONS

	1938	1939	1940
January	155	69	94
February	127	92	104
March	166	86	125
April	128	79	146
May	125	93	175
June	157	139	225
July	91	128	
August	104	142	
September	167	131	
October	121	100	
November	113	177	
December	120	121	

A comparison reveals the fact that every month during the first half of 1940 had a substantially greater number of completions than the corresponding month of 1939.

Thus the rate of completions increased instead of decreasing; and the average allowable per well, using Kornfeld's figures, declined from 23.734 barrels for October 1939 to 19.180 barrels for July 1940, notwithstanding an increase in total allowable for the state from 170,600 to 178,400 for the corresponding months.

The actual effects are precisely those that should have been anticipated, since the regulations in that instance granted larger allowables to the 20-acre wells, at the expense of the 10-acre wells already drilled, and thus tended to stimulate additional drilling on 20-acre units by giving them a temporarily more rapid rate of payout.

It should be obvious that the benefit to the 20-acre wells can only be temporary, since the increased rate of development will tend to drive their allowables back down toward the minimum allowable, although the process may be interrupted by increases in the total allowable for the state.

In the meantime, to whatever extent drilling has been stimulated by the expectation of quicker profits from new wells, the total number producing at a given time will have been increased; average well

allowables correspondingly lowered, and, instead of the promised savings, *the investment per barrel of allowable production will have been increased.*

Summarizing the discussion of wider well spacing, it has been shown that the arguments supporting it as a solution for the problem of declining allowables are untenable. Anticipated benefits have failed to materialize in practice, and in some instances regulations favoring wide spacing have aggravated the very situation they were intended to correct.

Suggested Changes

Declining allowables are primarily the result of an excessive rate of development. That fact and its corollary, that stability requires a reduction in that rate rather than a decrease in well density, must be recognized by the industry as the first step in a constructive approach to the problem. Then and only then can well spacing receive the impartial study which it deserves, as a major economic problem in itself.

The often repeated argument that lease contracts and the demands of royalty owners make it impossible for operators to exercise any control over the rate of development will not bear critical inspection. There are, of course, drilling obligations which have to be met and some demands which must be satisfied. But it is only necessary to examine a graphic chart of drilling activity over a period of years to be convinced that those are not the real factors controlling the total volume of drilling, and that development can be drastically curtailed under sufficient economic pressure.

That pressure will eventually be applied when average allowables reach or fall below the economic limit, if the industry continues to maintain an excessive rate of development. However, there is no inherent necessity for waiting until the correction is forced by a period of no profits, or actual losses on production.

It is hardly within the scope of this article to present a detailed discussion of the economics of proration; but it should be evident from this analysis, that any real solution for the problem of declining allowables must take the factor of time into account.

Because of their failure to do so, present proration systems have a common failing in that they put a premium on rapid development and penalize the operator who develops his properties at a moderate rate. Since new development can claim its share of the market without regard to the effects on the investment in existing wells, the operator who rushes his development as much as possible obtains the advantage of higher average initial allowables than are available for wells completed later in a moderate drilling campaign.

It is hardly to be expected that individual operators will restrain their activities in the interests of the industry as a whole, under systems which tend to force an opposite course to protect their own interests. Conversely, there should not be opposition to the introduction of a time factor into proration regulations, once it is understood that the effect would simply be to reconcile the individual's interest with those of the entire industry.

Indirect attempts to accomplish that purpose are evident in the Oklahoma system of classifying pools as A, B, or C fields, and in the Kansas discrimination against the fields of higher average potentials in the assignment of percentage allowables. Those provisions may have been partially effective in the early stages of proration when there were generally large differences in the productive capacity of old and new wells. But the Kansas regulations, for example, represent practically nothing except discrimination against the better fields, now that proration has reached the state where many wells over five years old show potentials as high as their initial tests.

Proration on the basis of individual field demand also tends to exert a restraining influence on new development; but it is open to the charge of unfair discrimination, and tends to encourage the application of political pressure in connection with the distribution of allowables.

The possibility of working out some means of applying a time factor directly in proration regulations appears worthy of serious consideration. For instance, allowables might be graduated on the basis of the age of the fields. Thus all fields over five years old might be given the top allowable, those four years old scaled down by 5 percent, and so on, so that wells in a field less than a year old would only be entitled to 75 percent of the top allowable.

Such a plan offers many advantages. It would place the restraint where it is most needed; that is, on unnecessary new development, without discrimination and without invoking arbitrary shut downs or a moratorium on drilling.

It would reward reasonable rates of development and penalize excessive ones.

It would encourage the continuance of development until a field was fully exploited, in contrast to the economically absurd situations now existing in many fields more than five years old, where a reasonable rate of further development cannot be financed out of the field revenue, due to gobbling of the available market due to excessive drilling in other areas.

It would put well spacing back where it belongs, as a question to be decided on its merits rather than a panacea for the ills of the industry.

Summarizing: The application of a time factor in proration would promote true conservation, by aligning the interests of individual operators with those of the industry as a whole; by encouraging complete development of existing fields; and tending to avoid an excessive rate of development with its economic losses due to excessive investment per barrel of allowable production and to proration carried beyond the point of most efficient production for a particular reservoir.

THE OIL WEEKLY believes declining per well allowables one of the most serious problems confronting oil producers. In the past year it has devoted considerable space to discussions on the subject. It is happy to publish the present article, and would welcome others from industrial leaders.

Perhaps through sufficient "airing" of ideas and views, the industry could attain some acceptable and intelligent program that will abate the trend that threatens producers with an eventual period of chaotic financial conditions.

Practical Use of Subsurface Pressure Measurements In East Texas

By N. N. JONES
Humble Oil & Refining Company, Overton, Texas

THERE probably has been more written on subsurface pressure measurements in the past ten years than on any other single subject dealing with the production of oil. This is understandable as it was during the past decade that most satisfactory development of subsurface pressure instruments took place. However, there was considerable experimentation and work on these instruments during the late twenties.

The data accumulated from subsurface pressure measurements has opened up a vast store of information for the practical operator as well as for the production and research engineers. Not only are conditions in the reservoir better understood but individual well problems have been analyzed with better results.

The purpose of this paper is to describe briefly the measurements of subsurface pressures and point out the practical uses to which these measurements have been put in East Texas. The purely theoretical aspects of this subject have been avoided purposely.

THE first known attempts to obtain subsurface pressure measurements were in Rumania in 1918 and 1919. However, it was 1930 before any real applications of pressure measurements were made in the oil fields. Bottom-hole pressures were first taken in the East Texas field in 1931. At the present time there are 15 companies and individuals operating bottom-hole-pressure gauges and one company operating a fluid level detector in the field.

Subsurface Pressure Instruments

A subsurface pressure gauge, commonly called a bottom-hole-pressure bomb, is very simple in principle and differs from a common pressure gauge mainly in the respect that it must be small enough to be lowered into tubing or casing. It has the same essential parts as a recording pressure gauge, i.e., (1) a case, (2) a spring or Bourdon tube, (3) a gauge hand or stylus and (4) a clock to turn the chart. The gauge is enclosed in a steel case, usually about 1¼ inches in diameter and 40 to 52 inches long. The principal of operation is similar to the well-known surface pressure gauge. Pressure is exerted on the pressure element causing it to move, which, in turn, moves the stylus (gauge hand) and marks the amount of extension on the chart. The amount of extension is readily converted into pounds pressure by referring to the calibration curve of the particular instrument.

There are several different types of bottom-hole-pressure instruments, some of which are covered by patents. The three most common are the spring, Bourdon tube and diaphragm types. These differ primarily in the type of pressure element. Figure 1 shows a spring type and Figure 1a, a Bourdon-tube type instrument.

The operation of the spring type bomb is as follows: Well pressure acts upon piston A which is resisted by extension of spring B. The spring extension is recorded by a stylus C upon paper within the recording drum D. Clock E turns drum at constant speed. The operation of the Bourdon tube type is different only in that the pressure extends the Bourdon tube instead of a piston and spring.

In most bottom-hole-pressure bombs a maximum recording thermometer can be attached to obtain the temperature of the fluid in the well.

N. N. JONES

Bottom-hole-pressure instruments usually are lowered into the well through a stuffing box using wire-line-measuring devices. The pressure at any point in the fluid column in the tubing of a well can be measured merely by lowering the bomb to that point.

Data Obtained by Subsurface Pressure Instrument

The following information can be secured by the use of a continuous recording bottom-hole-pressure bomb.

A. Bottom-hole-pressure (static and flowing). This is the hydrostatic pressure exerted by the column of liquid above the bomb plus that caused by the weight of gas plus the casinghead pressure.

B. Static and flowing gradients.

This is the average weight of the fluid per linear foot in pounds per square inch between two points of known pressure.

C. The gas-oil contact or fluid level.

D. The water-oil contact. This is the point of division between oil and water in a column of fluid.

E. The productivity index is defined as the barrels per day of gross fluid produced per pound per square inch pressure drop in the producing sand.

F. Specific productivity index is the productivity index divided by the feet of producing formation exposed.

The productivity index or factor and specific productivity factor can, for most practical purposes, be considered a measure of the permeability of the producing formation.

Figure 2 shows diagrammatic sketches of pressures in a well under static and equalized flowing conditions. The calculations illustrate how these pressures are used to determine the fluid levels and productivity factors. The sketch labeled "A" shows the well in static condition and "B" the same well flowing after it has reached an equalized condition or point of maximum drawdown producing 30 barrels per hour. These sketches are not of an actual well, as it is seldom that identical pressures and fluid gradients exist in the casing and tubing.

Figure 3 is a typical chart obtained from a continuous recording pressure gauge. The operator's interpretation has been written in on the chart.

Figures 3A and 3B are curves

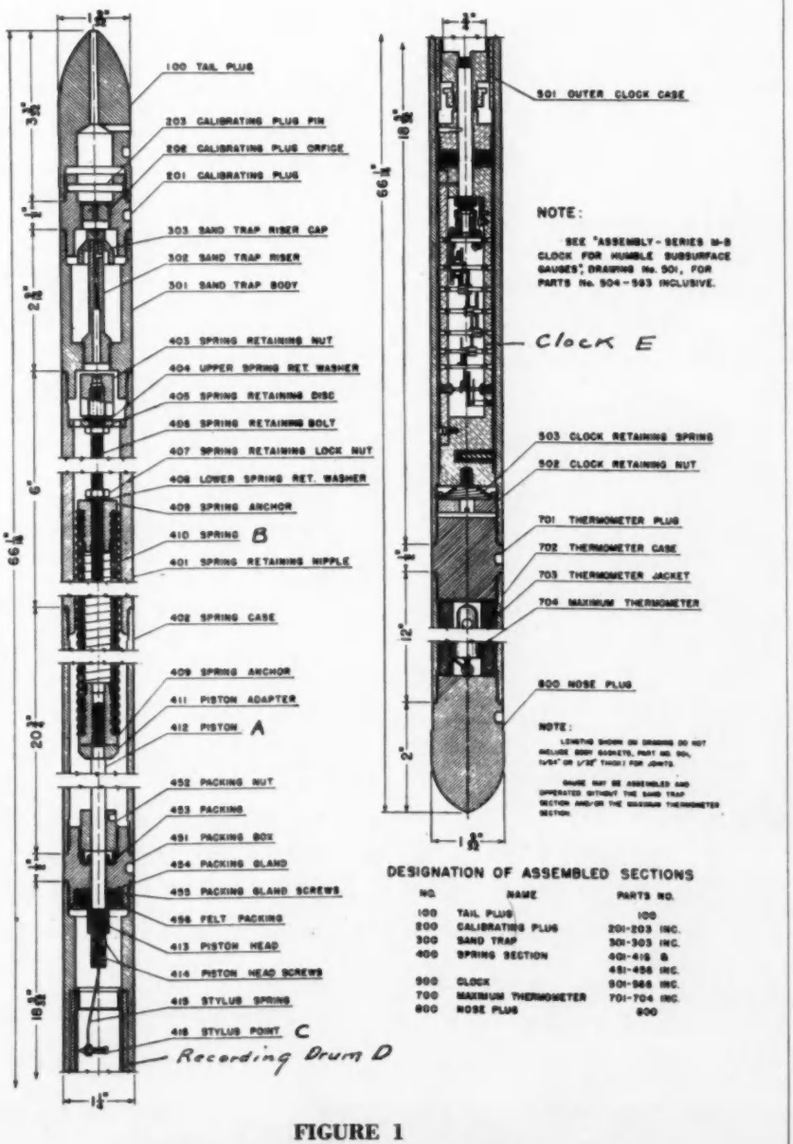


FIGURE 1

Spring type bottom-hole pressure instrument.

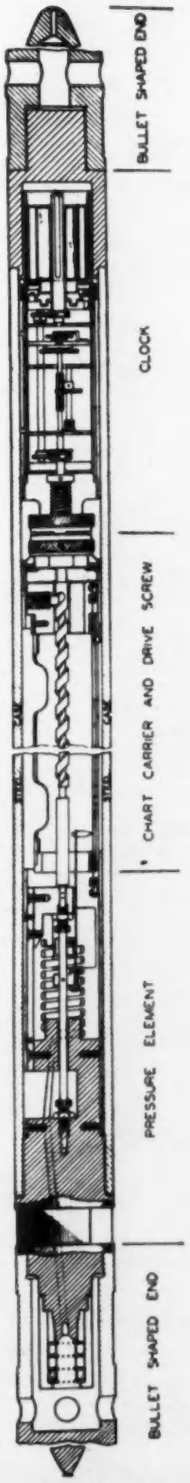


FIGURE 1A

Bourdon type bottom-hole pressure instrument.

made up from information obtained from the chart shown in Figure 3.

Fluid Level Determinations

Other devices used for determining subsurface pressures include wave impulse instruments or detectors. These instruments are particularly adapted to application in pumping wells when it is not desired to remove sucker rods, or when it is desired to determine fluid level in the casing and subsurface pressure when wells are pumping. A sound wave is created by suddenly injecting gas into the annular space or by momentarily releasing gas from the casing or by firing a gun in a chamber connected to the annular space. Movement of the wave is affected by obstructions such as tubing collars, tubing catchers, liner tops, fluid level, etc., and variations in movement are reflected by recording instruments at the surface. By correlating time with the wave reflections and known positions of various obstructions, fluid level can be determined. Subsurface pressure can then be determined from the fluid level and weight of fluid.

Use of Subsurface Pressures as Applied to Whole Reservoir or Field

The data secured from subsurface pressure measurements is used for so many purposes that it will be impossible to go into great detail on any of them in a limited time. In confining this discussion to the use of subsurface pressure data in the East Texas field only, several very important uses of this information can be disregarded. The practical use of these data is first discussed as it applies to the whole reservoir or field.

Reservoir Performance

"The application of subsurface data to the results obtained from laboratory studies of the flow of liquid through porous media has made it possible to explain not only the water drive and past performance of the East Texas reservoir, but also to predict within reasonable limits of accuracy the future behavior of the average reservoir

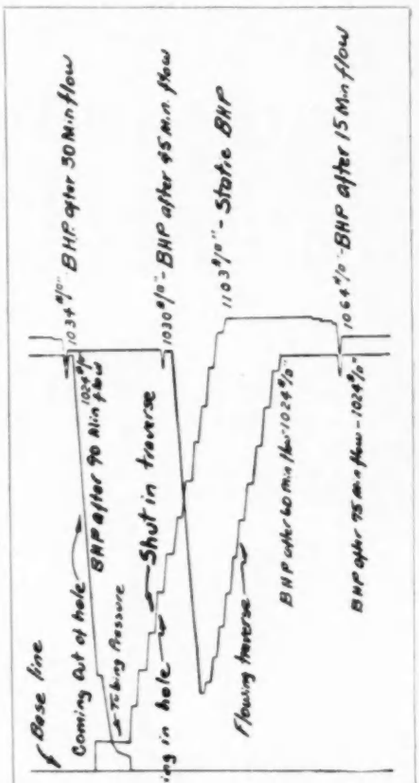
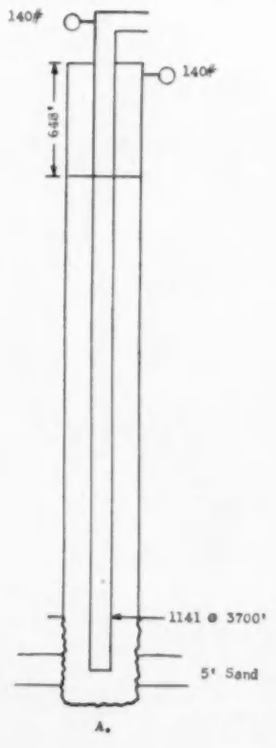


FIGURE 3



METHOD TO DETERMINE FLUID LEVEL

Formula:

$$\text{Test Depth} = \frac{\text{B.H.P.} - \text{Surface Pressure}}{\text{Gradient}}$$

Test Depth 3700'
B. H. P. = 1141 — Surface Press. 140 lbs.
Gradient .328 lb./ft.

$$\text{Fluid Level} = 3700 - \frac{1141-140}{.328}$$

EXAMPLE OF CALCULATIONS SHOWING DETERMINATION OF PRODUCTIVITY FACTOR AND SPECIFIC PRODUCTIVITY FACTOR

After fluid level had reached its lowest point as indicated by bottom hole pressure—the well produced 30 bbls. in one hour from the formation.

Bbls. per hr. = 30.
Bbls. per day = 30 × 24 = 720.
Lbs. press. drop = 1141 — 992 = 149 lbs.

$$\text{Prod. Factor} = \frac{\text{Bbls. per day}}{\text{Lbs./sq. in. press. drop.}}$$

$$\text{Specific Prod. Factor} = \frac{\text{Prod. Factor}}{\text{Ft. Prod. Formation}}$$

$$\frac{4.83}{5} = .966$$

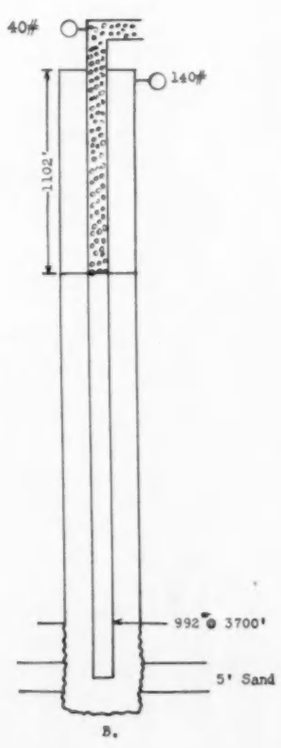


FIGURE 2

Diagrammatic sketches of pressures in a well under static and equalized flowing conditions.

Sketch "A", left, shows the well in static condition and Sketch "B" shows the same well flowing after it has reached an equalized condition or point of maximum draw-down producing 30 barrels per hour.

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POWER is the life of the pipe-line. And *"Caterpillar" Diesel Power* is doing more of this work every day. For these engines have proved to operators, in all parts of the country, that they're 24-hour-a-day engines . . . ready and able to stand steady, heavy duty at the pumps with a dependability and low cost that mean both *success* and *profit* for the job!

Consider the long-life construction of a "Caterpillar" Diesel . . . its readily available parts-and-service facilities, regardless of where you are . . . its simple operation without frequent and delicate adjustments, and you have *reasons enough* for putting this power on your pumps! To these important advantages, add this:

The *exclusive* "Caterpillar" Diesel fuel-system which regularly uses such a low-grade fuel as No. 3 domestic furnace oil. It can be adapted to handle cleaned crude. Or another type of conversion, readily made in the field, fits the two larger engines for burning natural gas!

See your nearest "Caterpillar" dealer, or write direct to the factory, for further information.

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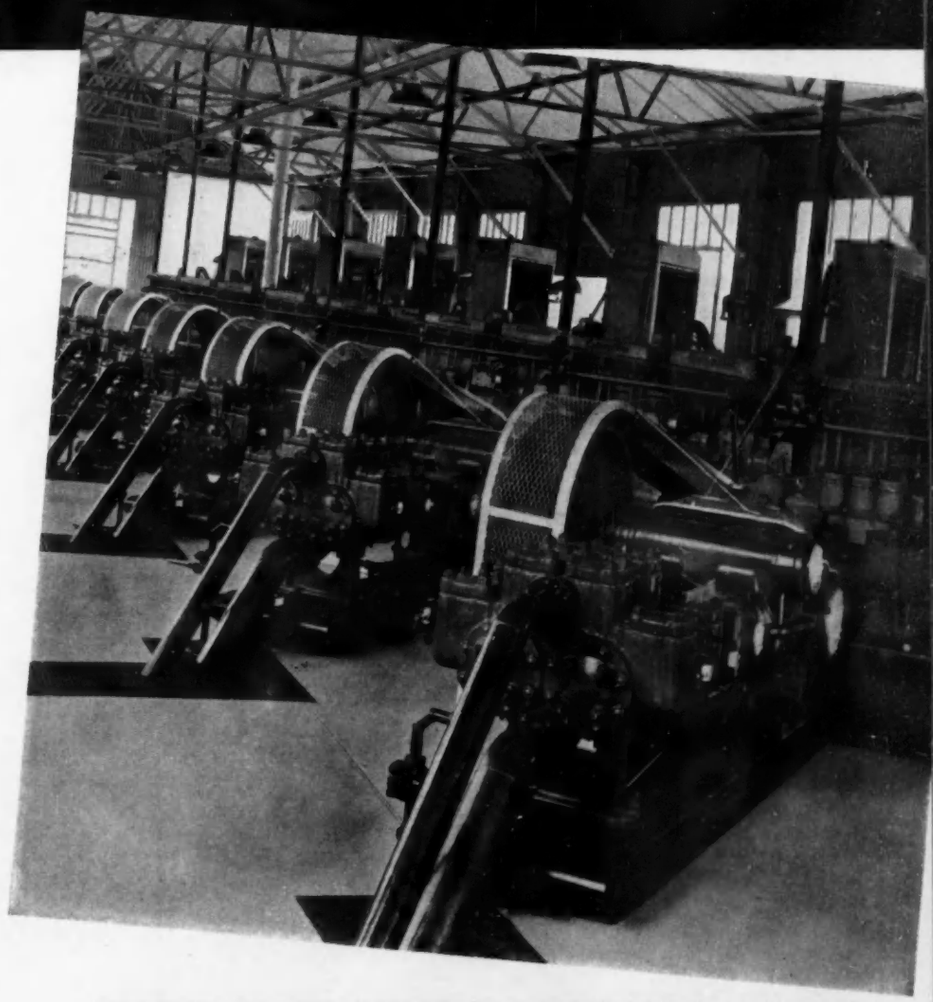

Part of a battery of 15 "Caterpillar" Diesel D13000 Engines driving 5 x 10-inch Gaso pumps on a 10-inch pipe-line near Salem, Ill. Converted for natural gas, these engines supply power 24 hours a day—every day!

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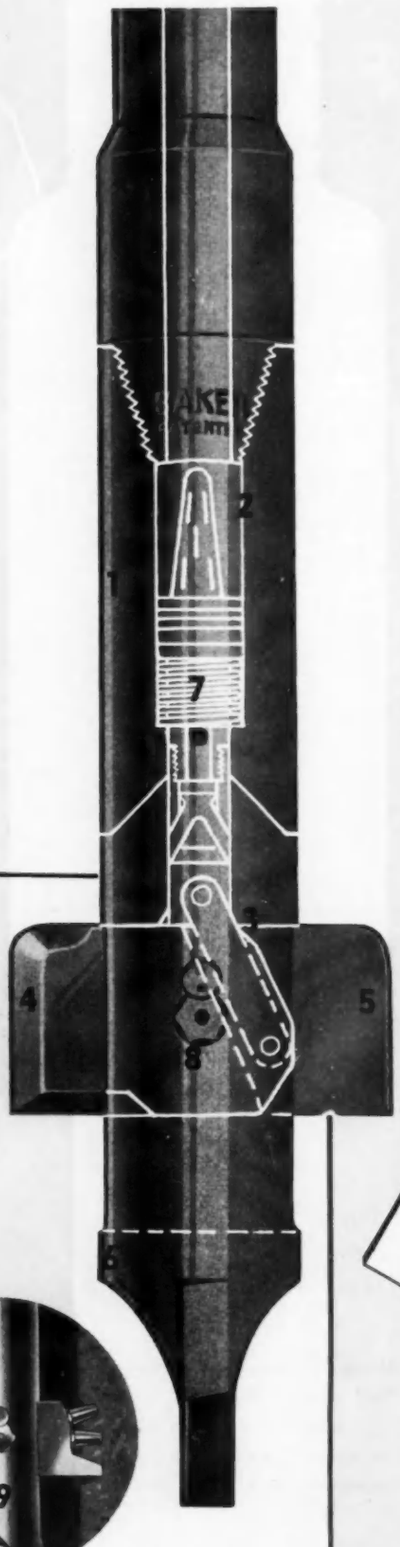
A TOOL AS STURDY *and* Dependable AS THE MEN WHO RUN IT

Drilling Crews are a Sturdy, Dependable lot . . . they HAVE to be . . . and they like to work with tools of the same calibre . . . which is one reason why the Baker Wall Scraper is, and ALWAYS HAS BEEN, a top favorite among experienced oil operators.



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1. Sturdy Construction . . . withstands USE and EVEN abuse.
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4. Long Reaming Surface . . . no corkscrewing.
5. Blades Hard-Faced . . . maximum cutting life.
6. OD Same as Tool Joints . . . can't hang up.
7. Positive Blade Opening and Closing . . . safety first and LAST.
8. Steels that Stand Up . . . carefully selected for performance.
9. Conversion into a Baker Wall Sampler by Changing Blades . . . an exclusive Baker Feature.

THE BAKER ROTARY HYDRAULIC EXPANSION WALL SCRAPER provides a safe and economical means of enlarging an open hole to a diameter considerably greater than the diameter of the casing through which it is run. The Wall Scraper enlarges the hole at any desired point, and has an amazing reaming capacity which insures successful accomplishment of many jobs never before considered possible.

A few typical uses are shown on the opposite page, but we suggest that you write for a free copy of Baker Broadcast No. 19 which contains complete information on the operation and applications of this practical and dependable tool.

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YOU WILL FIND THE BAKER ROTARY WALL SCRAPER SAFE, ECONOMICAL and SIMPLE to use for . . . Enlarging Holes for Setting Casing · Cleaning Up Oil Sands · Setting Liners · Setting Cement Plugs · Bottlenecking for Cement Jobs · Removing Sections of Drillable Pipe · Water Shut-off Tests · Side-tracking Fishing Jobs · Enlarging Holes for Gravel Packing.

BOTTLENECKING THE HOLE FOR BETTER CEMENTING

1. *The Baker Rotary Wall Scraper used to enlarge the hole so that cement will be sure to surround the casing completely and with greater thickness.*

2. *Cement in the enlarged hole forms a uniform plug—and channels which might have resulted from contact of the casing with the wall, have been avoided.*

REMOVING SECTIONS OF DRILLABLE PIPE

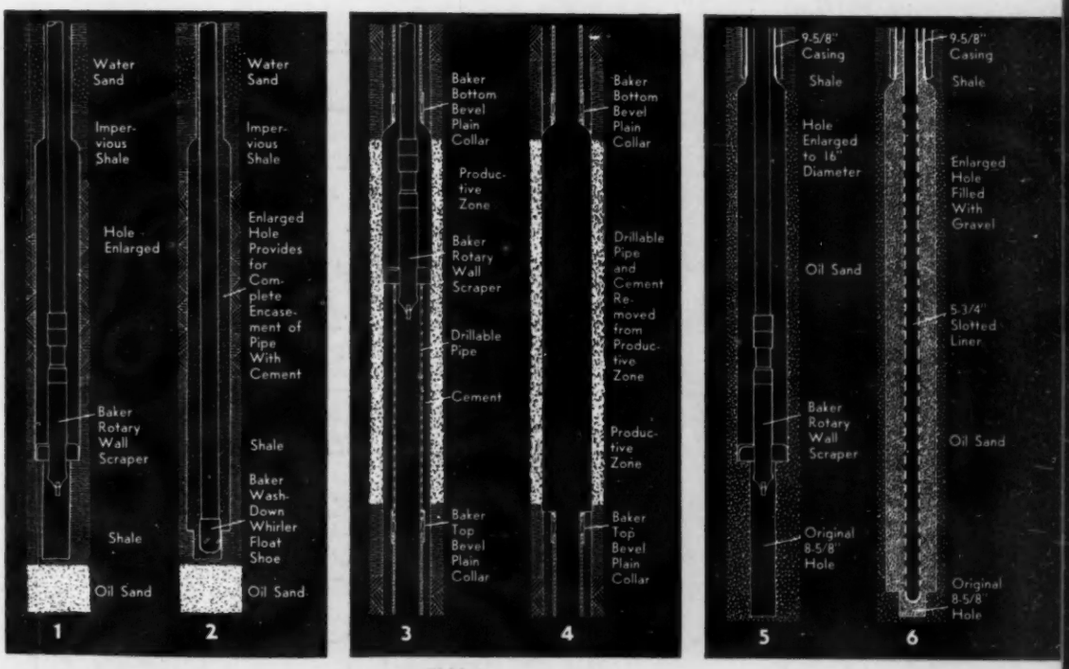
3. *The Baker Rotary Wall Scraper effectively removes both the section of drillable pipe and the cement behind the pipe. The hole is enlarged slightly to clean the face of the oil zone.*

4. *The cemented Drillable Pipe, through the productive zone, has been removed and the well is ready to be completed in this zone. The face of the formation has been scraped clean.*

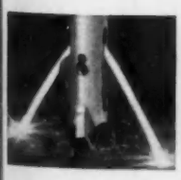
ENLARGING HOLE FOR GRAVEL PACKING

5. *The Baker Rotary Wall Scraper is used to enlarge the hole and thus permit packing a substantial amount of gravel around the liner.*

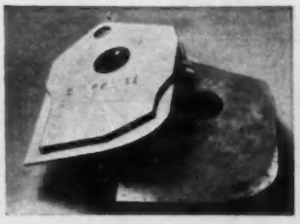
6. *Here is the completed job, with the slotted liner landed and surrounded with gravel in the area enlarged with the Wall Scraper.*



SUCCESS IS DUE TO EFFICIENCY, SAFETY AND LONG LIFE



Pump pressure causes the circulating fluid to force an enclosed piston downward thus expanding the blades upward and outward against the formation. By directing the fluid against the blades, the cutting surface is lubricated and cooled, and formation cuttings are circulated out of the hole. Left view shows blades starting to expand; right, blades are fully opened.



If a fragment of metal prevents closing of blades, contact of the top of the blades against the casing shoe results in shearing through or dislodging such obstructions. In actual tests the blades sheared a one-inch steel bolt.

The blades are machined from SAE 4145 Chrome Molybdenum steel forgings with ample recesses for hard facing and setting with Tungsten carbide inserts.

AMAZING REAMING CAPACITY FOR ALL REQUIREMENTS

Thousands of runs have demonstrated that Baker Rotary Wall Scrapers combine tremendous strength with minimum overall dimensions. This fact explains why the Scraper can be run through comparatively small diameter casing and then scrape small diameter hole below the casing to a truly amazing diameter. For example, a No. 6 Baker Wall Scraper will run through 9⅝" API Casing readily, and then will ream from a minimum of 9¼" to a maximum of 19" in ¼" steps depending upon the gauge of the blades in use.

Rotary Wall Scraper

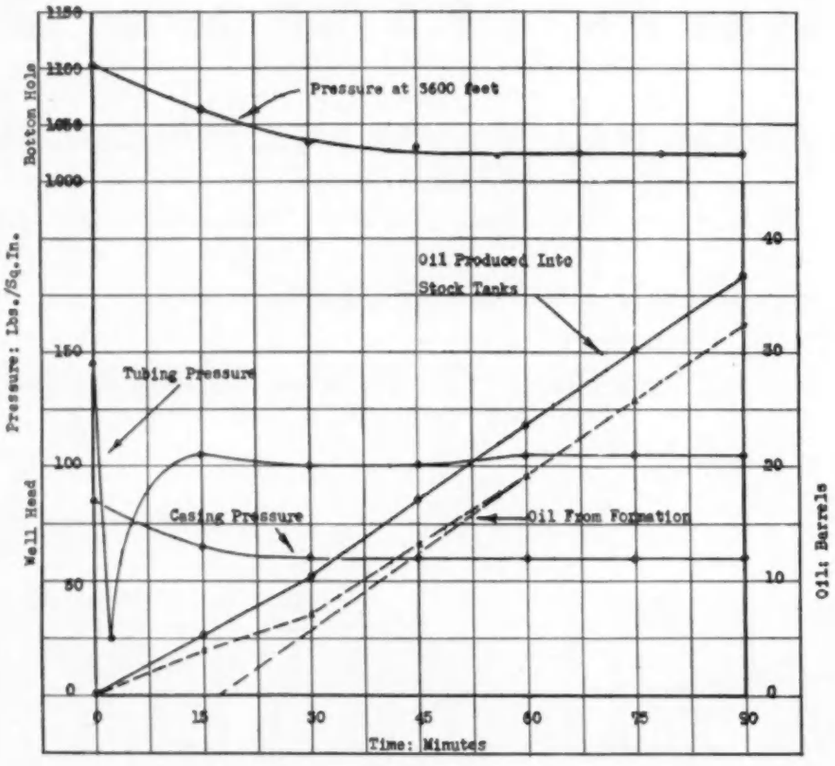


FIGURE 3A

A flowing well in East Texas.

Total Depth: 3689'. Top of Sand: 3684'. Test Depth: 3600'. Elevation: 397'. 7" 24 lb. casing; 2½" tubing; screen through sand section. Productivity Factor: 7.7 B/D/lb. Specific Productivity Factor: 1.55 B/D/lb./ft. Flow Rate: 25.6 B/Hr.

pressure," says Reistte. Numerous other writers have made use of bottom-hole-pressure data to explain conditions within the East Texas reservoir. In fact, for several years the greatest value of bottom-hole-pressure data accumulated was for the study of reservoir conditions as a whole.

The bottom-hole-pressure data accumulation in the field in its early life showed good maintenance of reservoir pressure, particularly in the western part of the field. This fact with steadily increasing water production from this area indicated a water drive from the west side of the field. "There is no doubt that water did encroach into the oil

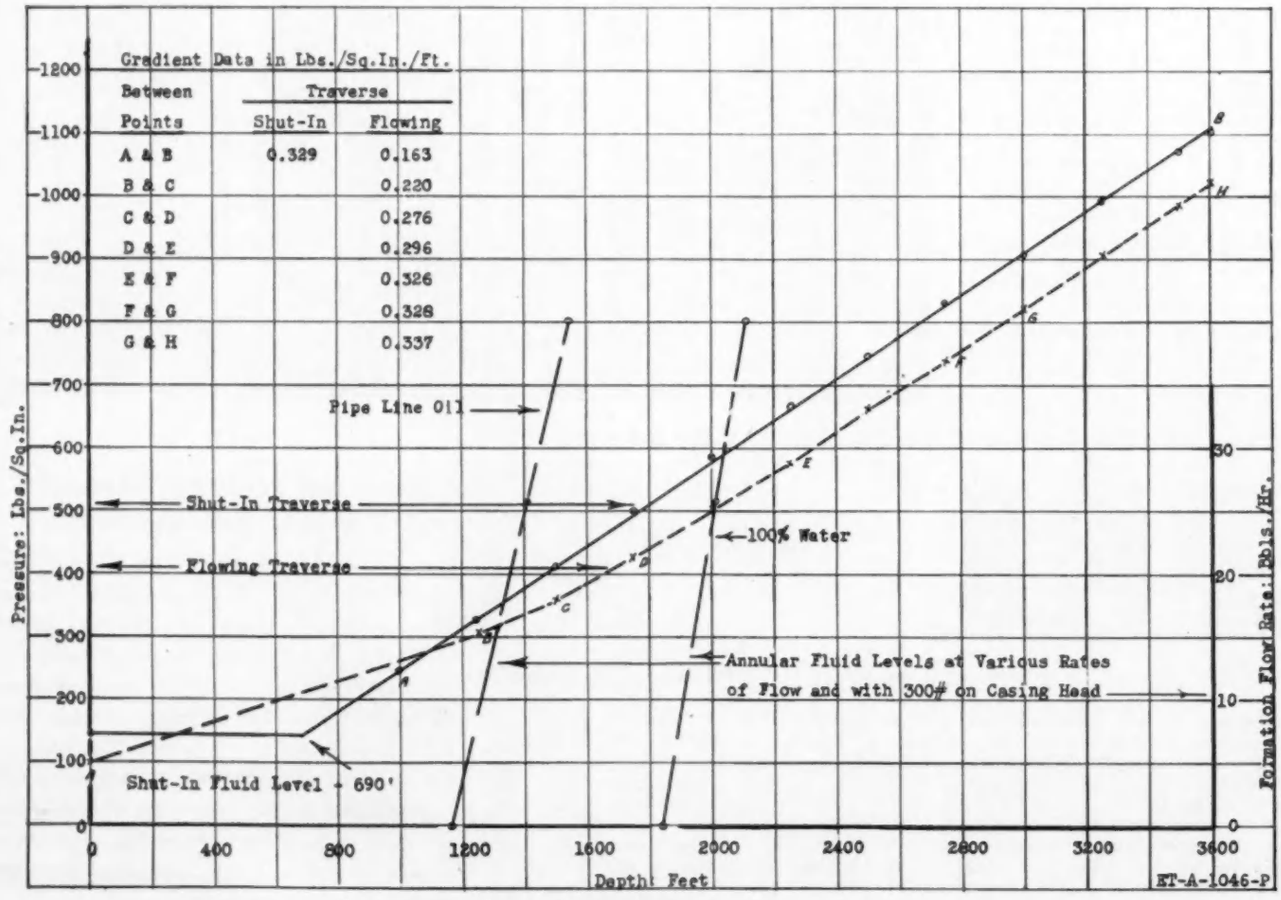

Gradient Data in Lbs./Sq.In./Ft.
Between Points | Traverse: Shut-In | Flowing
A & B | 0.329 | 0.163
B & C | | 0.220
C & D | | 0.276
D & E | | 0.296
E & F | | 0.326
F & G | | 0.328
G & H | | 0.337
Pipe Line Oil
Shut-In Traverse
Flowing Traverse
100% Water
Annular Fluid Levels at Various Rates of Flow and with 300# on Casing Head
Shut-In Fluid Level - 690'
Pressure: Lbs./Sq.In.
Formation Flow Rate: Bbls./Hr.
Depth: Feet
ET-A-1046-P

FIGURE 3B

Pressure Traverses and Annular Fluid Levels. August 1, 1940.

FIGURE 4

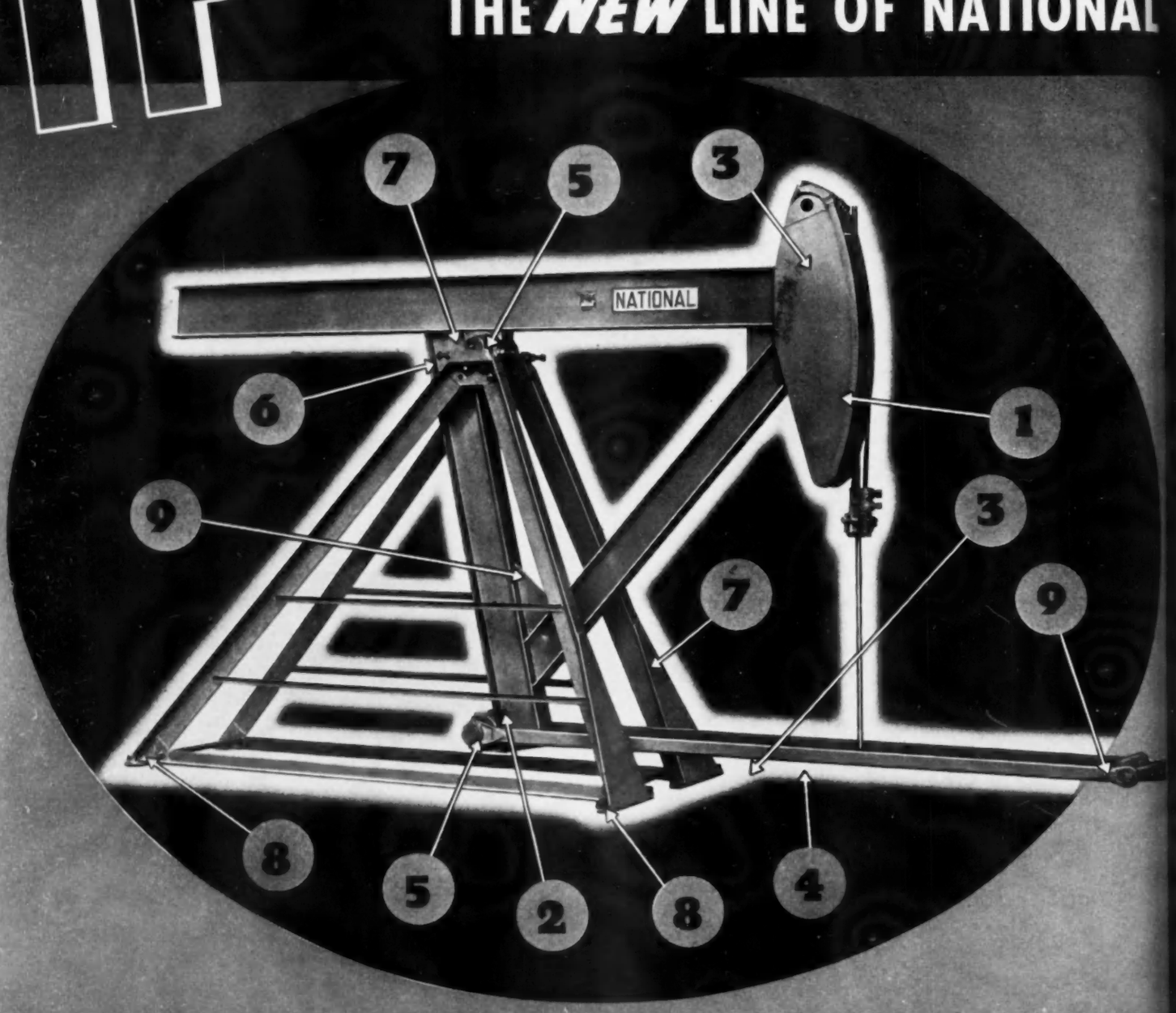
Bottom-hole pressure map of East Texas field during the last quarter of 1933.

FIGURE 5

Bottom-hole pressure map of East Texas field during the last quarter of 1940.

IF YOU'RE LOOKING FOR EC

THE *NEW* LINE OF NATIONAL RO



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5 ANTI-FRICTION BEARINGS—Reduced friction loss... Longer wear—Better lubrication—No noisy bearings—Assurance of alignment of bearings and beam shaft in any position.

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7 FRAME DESIGN—Pyramid type—Fixed saddle shaft as spacer adds rigidity—Laterally braced front legs—Beam carried at true load center—Lasting alignment.

8 IMPROVED TYPE BASE—Welded in steel castings at feet—Greater stiffness at foundation contact—Proper spacing of foundation bolts—More effective transmission of loads to foundations—Extra bearing surface under front legs.

9 WELDED STEEL CONSTRUCTION—Electric welded throughout—Scallop welds at pull bars.

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BRIEF SPECIFICATIONS

TYPE	E-100	E-120	E-160
Rated polished rod load	10000	12000	16000
Rated stroke	40"	48"	56"
Maximum ratio, polished rod to pull rod stroke	1.54to1	1.54to1	1.54to1
Minimum ratio, polished rod to pull rod stroke	1.00to1	1.00to1	1.00to1
Over-all length of beam	10' 0"	12' 0"	14' 0"
Depth of beam	8"	10"	12"
Center of well to center of saddle bearing	5' 0"	6' 0"	7' 0"
Top of foundation to center of saddle bearing	5' 7"	6' 9"	7' 11"
Top of foundation to bottom of polish rod support at bottom of stroke	20"	21½"	28"
Front end of jack frame to center of well	2' 6"	3' 0"	3' 5½"
Length at base	7' 7"	8' 11½"	10' 6¼"
Width at base over front legs	4' 0½"	4' 2½"	5' 3"
Type beam hanger	True arc	True arc	True arc
Type anti-friction saddle bearings	Needle	Needle	Needle
Type anti-friction pull bar shaft bearings	Needle	Needle	Needle
Foundation bolts number and size	8-⅞x18	8-1x24	8-1⅛x24
Weight less foundation bolts	1210	1630	2390

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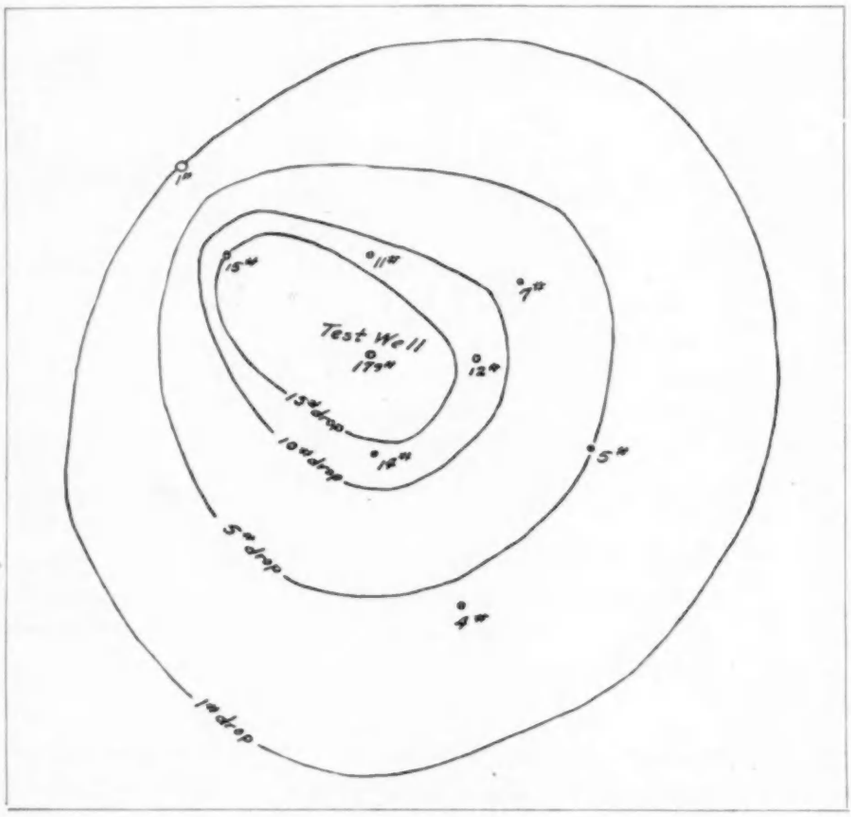


FIGURE 6A

Pressure contour map of an East Texas well showing the pressure drop in reservoir producing 961 barrels per hour.

by that well. Such data can be used to determine a practical spacing for future wells.

Figures 6A and 6B are actual examples of the pressure drop in the reservoir surrounding a well in East Texas producing 961 barrels per hour.

The data that these diagrams were drawn from were obtained by measuring the pressure drop with a bomb in the producing well and adjacent shut-in wells during a flow test.

Application of Subsurface Pressure Measurements to Individual Well Problems

It is the application of subsurface measurements to individual well problems that the average man in the field will find most useful. This is one place where he has control,

reservoir for, if the water had not moved in, the expansibility of the undersaturated remaining oil would permit less than seventy million barrels of production before the reservoir pressure would have been reduced to the saturation pressure of the oil; namely, 740 pounds per square inch."

Figures 4 and 5 are isobaric maps of the East Texas field with contours of the bottom-hole pressures during the last quarters of 1933 and 1940. Maps similar to these have been plotted at intervals by the Texas Railroad Commission and by a group of operators in order to study the characteristics of the field. Such data have been used for various purposes, especially to anticipate which sections of the field would need artificial lift first, and where to expect an early intrusion of water.

The bottom-hole-pressure bomb has enabled the operator to determine the pressure drop in the reservoir surrounding the producing well. This gave the producer an actual diagram of the area drained

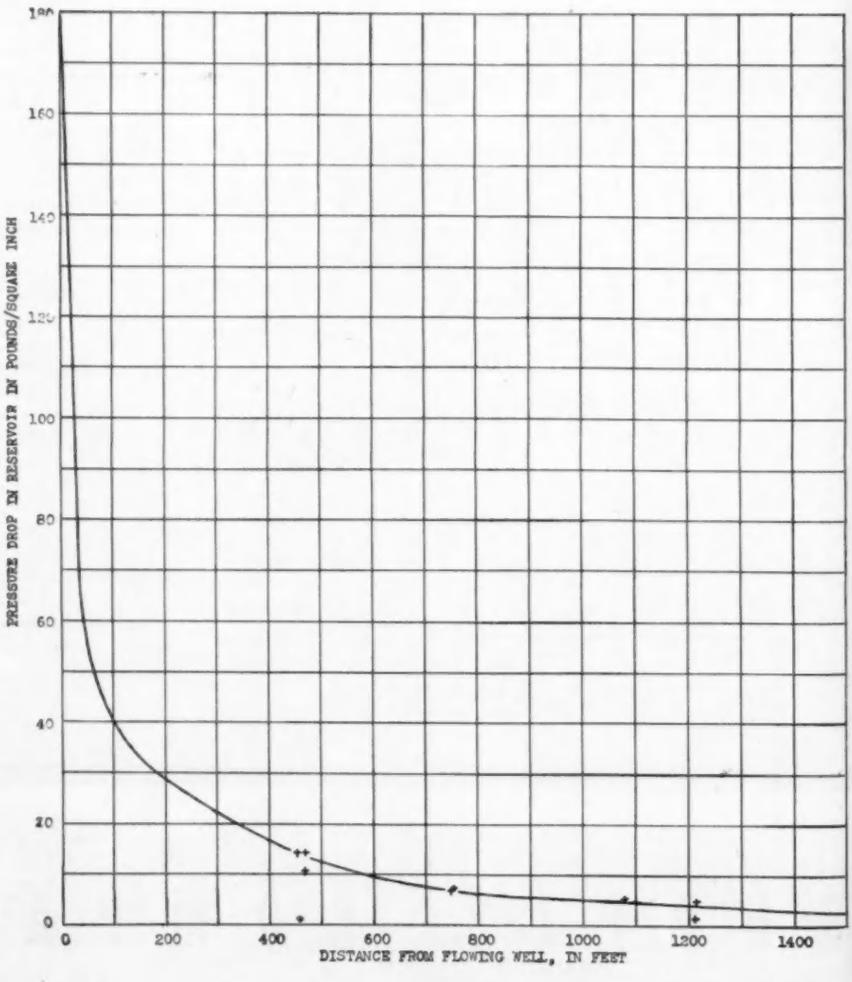
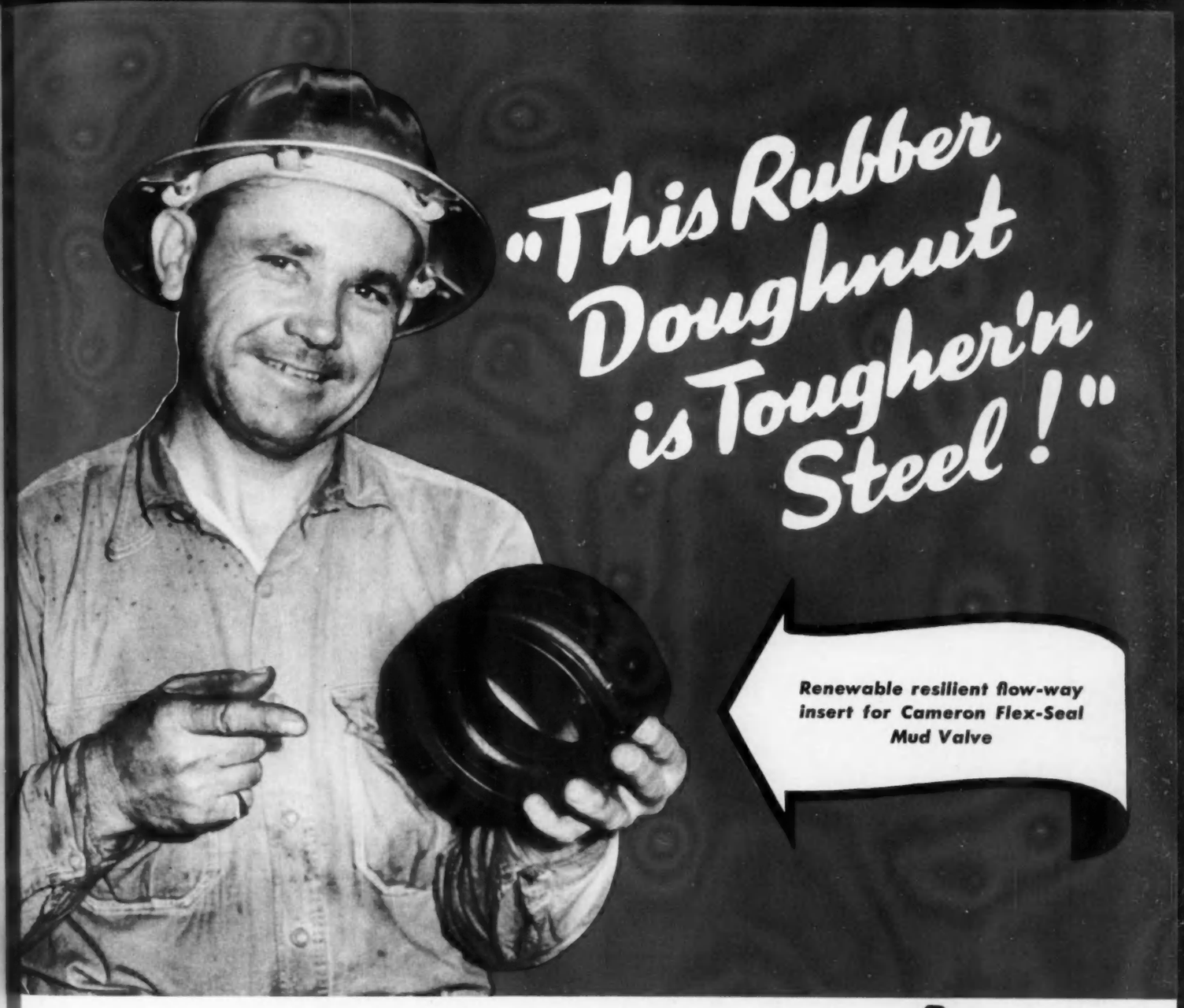


FIGURE 6B

Pressure drop in reservoir surrounding a well in East Texas field while producing 961 barrels per hour.



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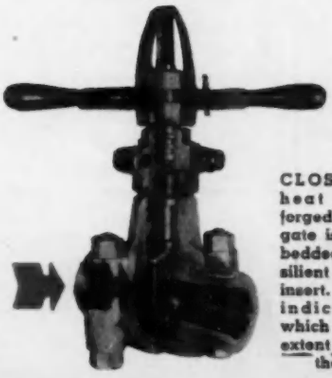
The Cameron Flex-Seal Mud Valve has no delicate metal-to-metal seals. The resilient insert provides a pressure-tight seat for the gate and seals the two-piece body of the valve. The stem packing is of lip-type construction which requires no packing gland. The hubs, with threaded, flanged, welded-on or any special connection desired, are attached to the body by means of interlocking shoulders and grooves. Thus, the type of end connections on the valve may be changed in the field at will. Also, no unions are required when making up a manifold as the hubs will swivel freely when the four body bolts are loosened slightly.

The entire valve is of forged steel. All parts subjected to wear are of heat-treated alloy steel.

Available in 2", 3" and 4" sizes, 6000-lb. test pressure

OPEN—The resilient lip type stem packing is expanded to provide a pressure-tight seal. Note that the gate is retracted completely out of the flow-way.



CLOSED — The heat-treated forged alloy steel gate is firmly embedded in the resilient flow-way insert. Note the indicater stem which reveals the extent of wear on the insert.

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and on the operation of the individual well or wells depends the profit or loss of the property. Here it is that bottom-hole-pressure data are applied by the production engineers, farm bosses and men in actual charge of securing the production in the field. The following are some practical applications of subsurface measurements to individual well problems.

Pumping Wells

From subsurface pressures the amount of fluid available is readily determined. This gives an accurate basis for the selection of pump and unit size. If after installation, production secured does not reach expectations, a check on bottom-hole pressure or fluid levels will show whether the pump is operating satisfactorily or if the trouble is due to lack of fluid coming into the hole.

In pumping wells, the use of fluid determinations by sound wave reflections has excellent application. By the use of the sound wave method, fluid levels are determined without removing rods from the tubing. If the weight per foot of fluid in the hole is known, the fluid levels can be converted into bottom-hole pressures and the productivity index determined.

If fluid level is standing high above the working barrel and the pump is not delivering its known capacity, it is quite evident that trouble has developed in the pumping element. On the other hand, if fluid level in the casing is near the working barrel, it is evident the pump is handling all the fluid that is coming into the hole. This knowledge will save pulling pumping equipment for repairs, or replacement with larger equipment when the equipment already in use is adequately handling all production available. Subsurface data is useful in determining whether "fluid pound" is being caused by lack of fluid in the well, by gas lock, or by standing valve restrictions.

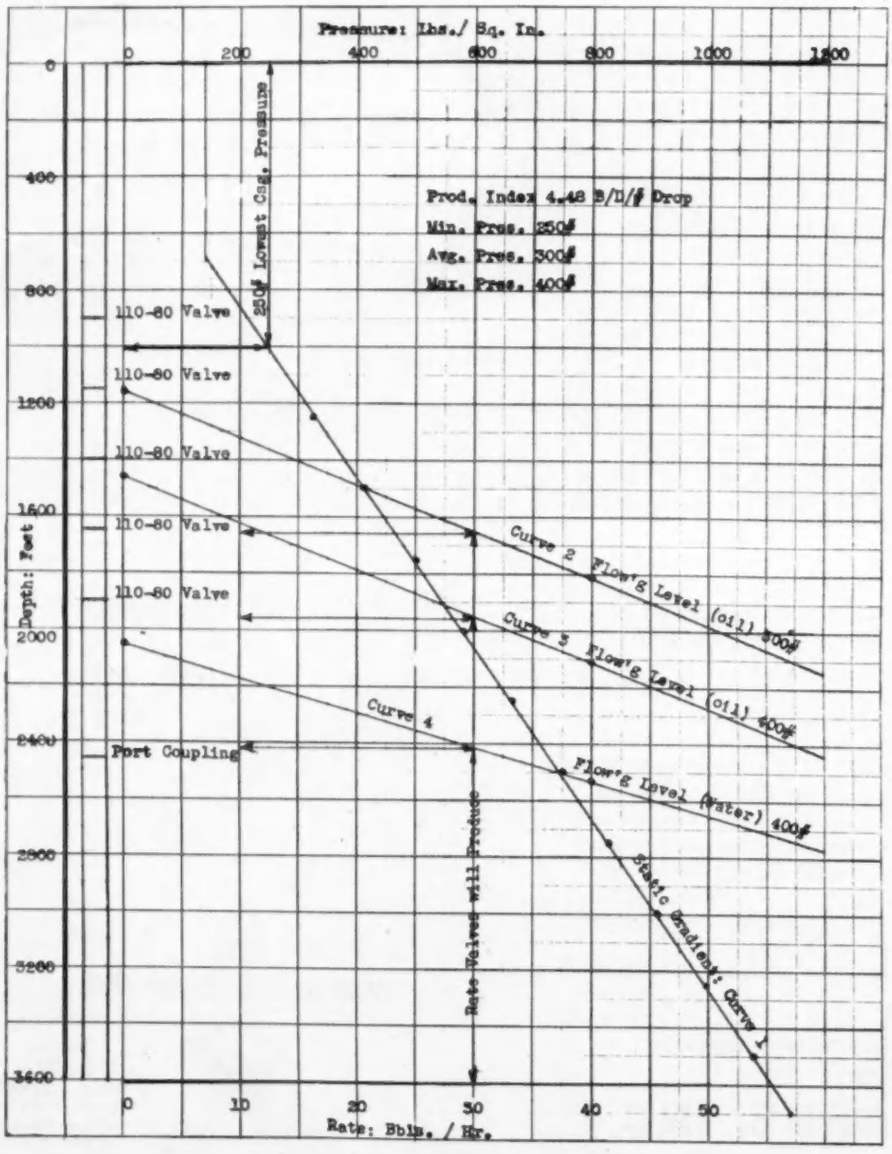


FIGURE 7
Design of a gas lift installation on a west side well in East Texas.

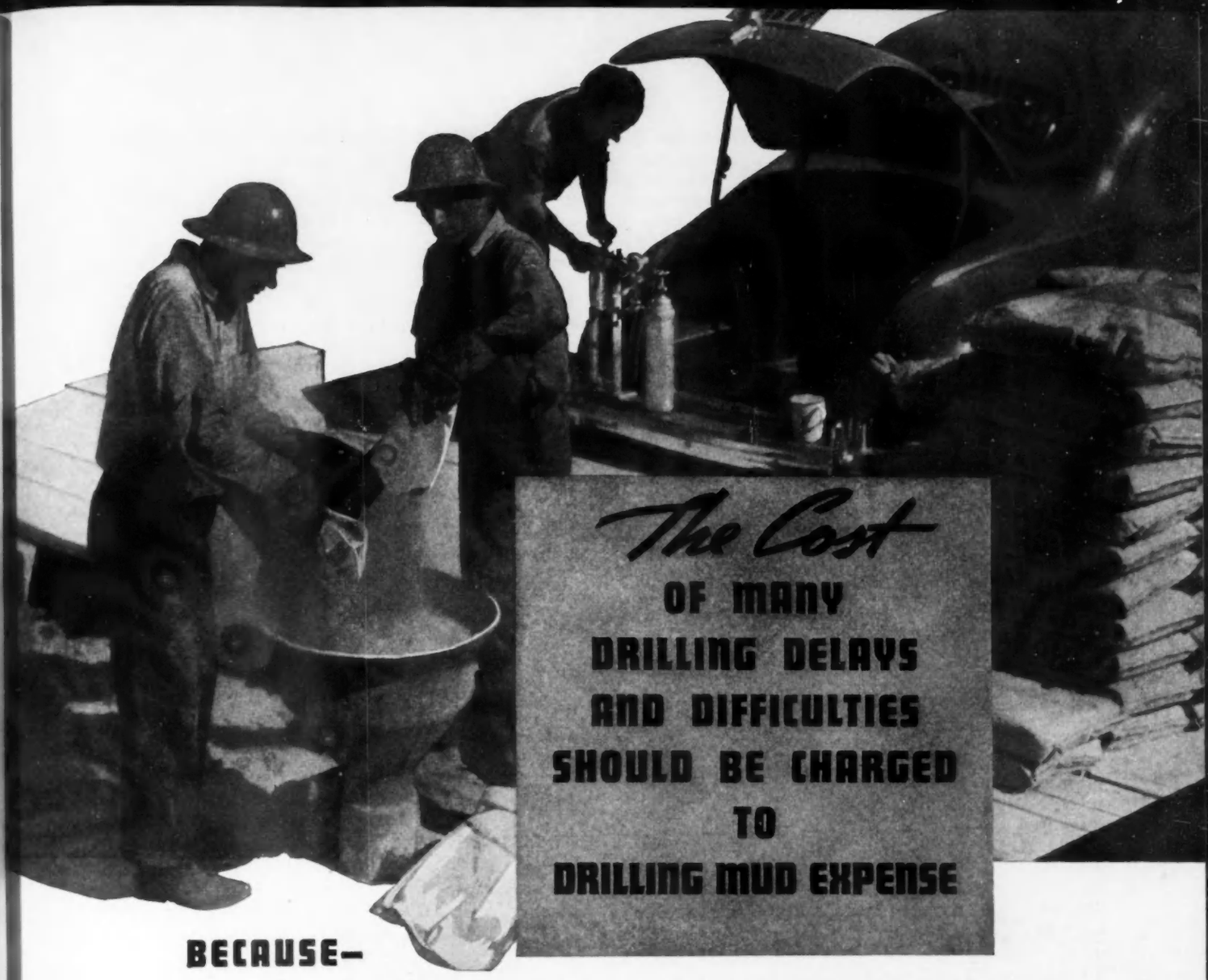
Gas-Lift Wells

Bottom-hole-pressure data have been used in East Texas to an advantage in designing and studying gas-lift installations. At the present, this is probably the most useful application of the bottom-hole-pressure bomb for the field man who has gas-lift operations. The bottom-hole-pressure instrument is now such an essential part of gas lift that some manufacturers of gas-lift equipment consider it necessary to operate their own bottom-hole-pressure bombs. I do not believe that any present-day manufacturer of gas-lift equipment would recommend the installation of his equipment in a well without some bottom-hole-pressure data on the well.

The operator who makes intelligent use of bottom-hole-pressure data can design more efficient and economical installations by placing valves or devices at the most ideal points in the tubing string. Costs of installations are reduced by eliminating unnecessary valves, and input gas ratios are reduced by having the valves at the points to give the greatest efficiency. With the bomb the operator can determine, in an installation not operating satisfactorily, many sources of trouble which cannot be found by any other method. This enables him to make necessary corrections in the installation without resorting to the expensive "cut and try" method which oftentimes has caused some operators to condemn gas lift as a method of producing.

The design of gas-lift installations for differential valves requires the use of bottom-hole data to determine the location of the top valve, the flowing valve, the lowest valve, the equalizing devices and the space between the valves.

1. The top valve should be placed above the shut-in annular fluid level with the minimum casing pressure. It is necessary to have a valve exposed to the annular gas at all times so the valve can operate. The shut-in fluid level is found



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One expensive fishing job (which might be eliminated by suitable mud) may be much more costly than the slightly higher cost of using the proper mud on a great number of wells with complete safety. Muds of slightly increased weight and suitable colloidal content provide protection against these troubles at minimum cost.

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by plotting the shut-in gradient on coordinate graph paper with pressure against depth. The lowest casing pressure is extended to the shut-in gradient and annular fluid level at this pressure is indicated. (See Figure 7—Curve 1.)

2. The flowing valve or port should be placed in the flow string just above the flowing annular fluid level after the well has equalized to secure the maximum efficiency. The flowing annular fluid level is determined from a productivity curve plotted with the rate of production against the annular fluid level using the average casing pressure. Correction is made for the type of fluid in the well. (See Figure 7—Curve 2.) The rate of production expected is extended to the curve and the flowing annular fluid level is indicated.

3. The lowest valve or port should be above the lowest practical flowing annular fluid level. This level is determined from a productivity curve plotted with the rate of production against the annular fluid level using the maximum casing pressure. The fluid level is corrected for the type of fluid in the well. (See Figure 7—Curve 3.) The maximum rate of production expected is extended to the curve and the annular level is indicated.

4. The equalizing ports or devices should be placed below the lowest possible annular fluid level. This is a theoretical level that would exist with all water in the well and maximum casing pressure while producing at a maximum rate. This level is obtained from a productivity curve plotted with rate of production against the annular level with all water in the well and the maximum casing pressure. (See Figure 7—Curve 4.) The maximum rate is extended to the curve and annular level is indicated.

5. The maximum space between the valves, or the distance a valve will unload below itself, is determined by dividing the differential opening pressure by the maximum gradient of fluid that will be produced from the annular space. If no water is to be produced, the average flowing gradient below the valve may be used.

Figure 7 is an illustration of the application of bottom-hole-pressure data to the design of a gas-lift installation for a west side well in the East Texas field. The gas pressure available is 250 pounds minimum, 300 pounds average and 400 pounds maximum.

The 250 pounds pressure is extended to the static gradient indicating the top valve should be above 1010 feet from the surface. It is assumed from past experience that the valves will produce 30 barrels per hour. Thus the 30 barrels per hour rate is extended to the respective curves indicating the operating valves should be just above 1650 feet, the lowest valve above 1950 feet and the equalizing port below 2415 feet. The valves are 110-pound differential opening, and the average gradient of the fluid that will be removed from the casing is .440 pound. This gives a spacing of 250 feet.

While analyzing flow valve installations the bottom-hole-pressure data were used to determine the following:

1. The incorrect spacing of valves was found by locating the fluid level in annular space and checking the pressure inside the tubing against casing pressure opposite the valve that failed to reopen. (See Figure 8.) The distance the fluid level unloaded below the valve was found to be the differential opening pressure of the valve divided by the gradient inside the tubing.

2. The valve that had failed to open due to the weakening of the valve spring, was also found by the above method when the valve did not open at its original differential. (See Figure 8.)

3. The point or points of gas injection by a valve, port or a leak in

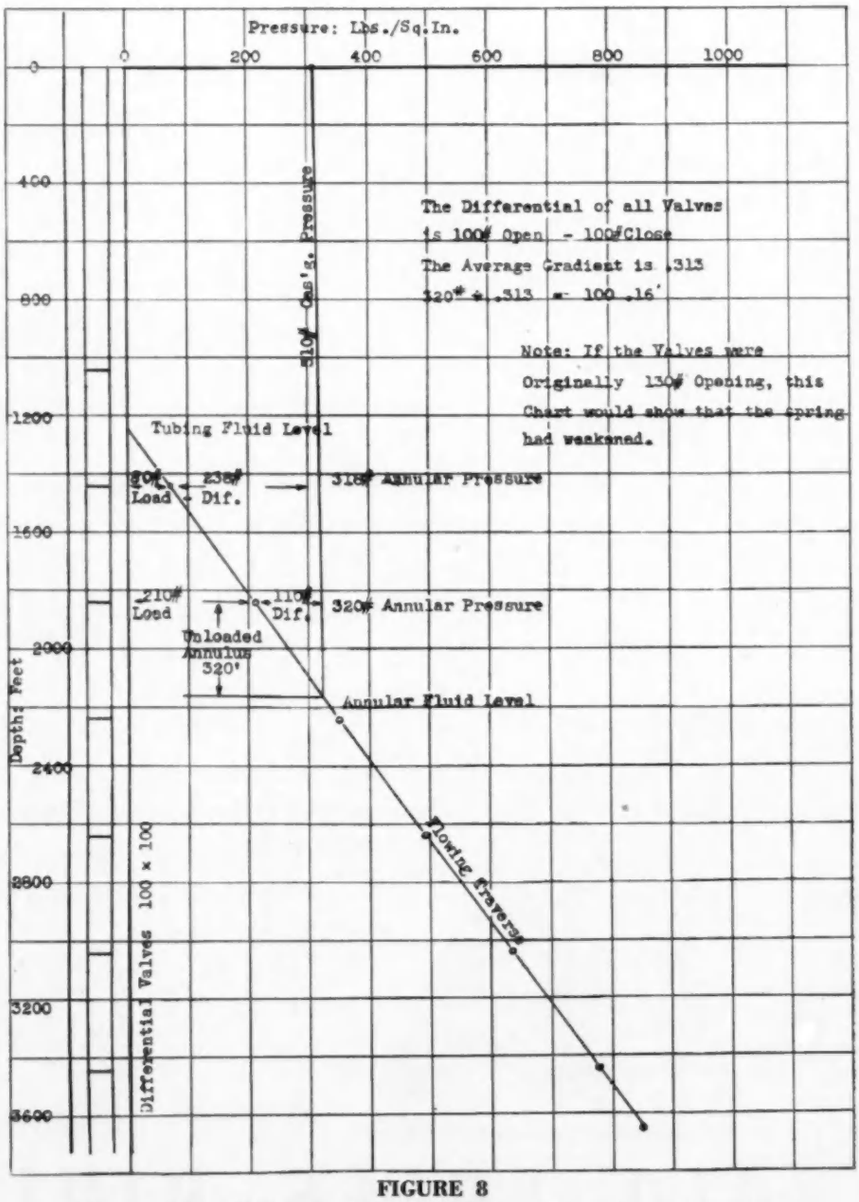

FIGURE 8

A gas lift installation in which the spacing of the valves is too wide.

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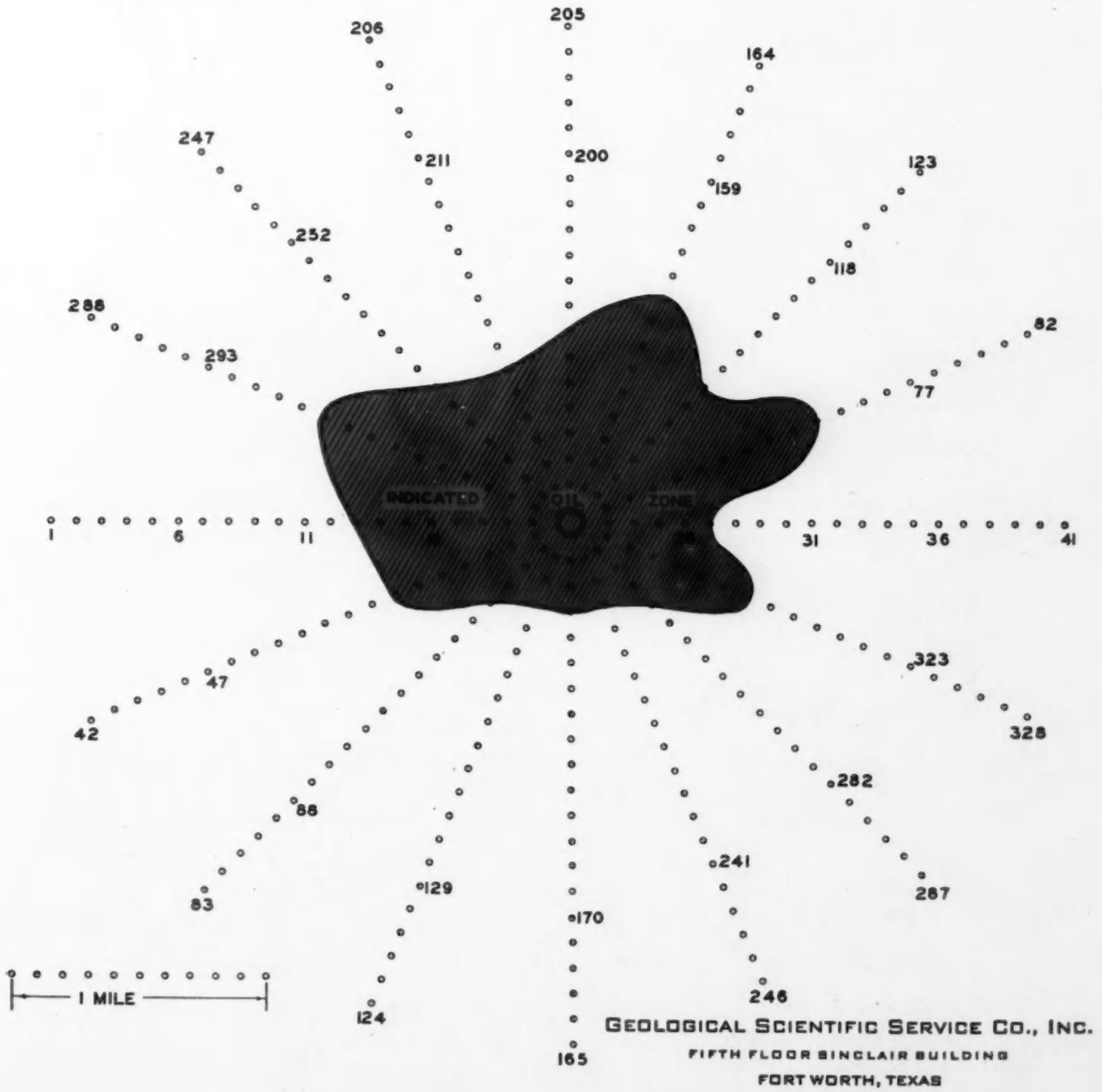

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the tubing was found by the change in slope of the flowing traverse. (See Figure 9.)

4. The submergence pressure at the valve was found with the flowing gradient. (See Figure 9.)

5. The differential pressure across the valves was found by subtracting the pressure inside the tubing from pressure in the annular space at the valve. (See Figure 9.)

6. The weight of the aerated fluid was determined by the flowing gradient. (See Figure 9.)

7. The water and oil contact was determined by the change in slope of the shut-in traverse. (See Figure 9.)

Bottom-hole pressures have been used in gas lift for other purposes, and in conjunction with other devices, however, this paper does not attempt to discuss all of them.

Figure 10 is the plotted gradient of a well that failed to flow because the valves were too far apart. The 100-pound differential opening valves are spaced 400 feet apart and the valve will only unload the annular space 320 feet. This leaves the next valve submerged 60 feet under fluid. The valves would unload the 400 feet of fluid with 130-pound differential valves.

The same figure illustrates the type of data that would indicate a weakened valve spring if the valves had been 130-pound differential opening when they were installed.

Figure 9 is a plotted shut-in and flowing traverse that indicates the oil-water contact, the point of gas injection and the submergence of the valve or port that is injecting gas. The water-oil contact is indicated at 3120 feet by the change in slope of the shut-in traverse, and the gradient below this point indicates water. The point of gas injection is indicated at 1600 feet by the change in slope of the flowing traverse and the gradient above this point shows highly aerated fluid. The submergence at the point of injection is 267 pounds, the reading of the bomb at that point.

The differential across the valves is 115 pounds and 78 pounds, respectively. This was found by reading the pressure in the annular space from the curve and subtracting the pressure inside the tubing at the valves.

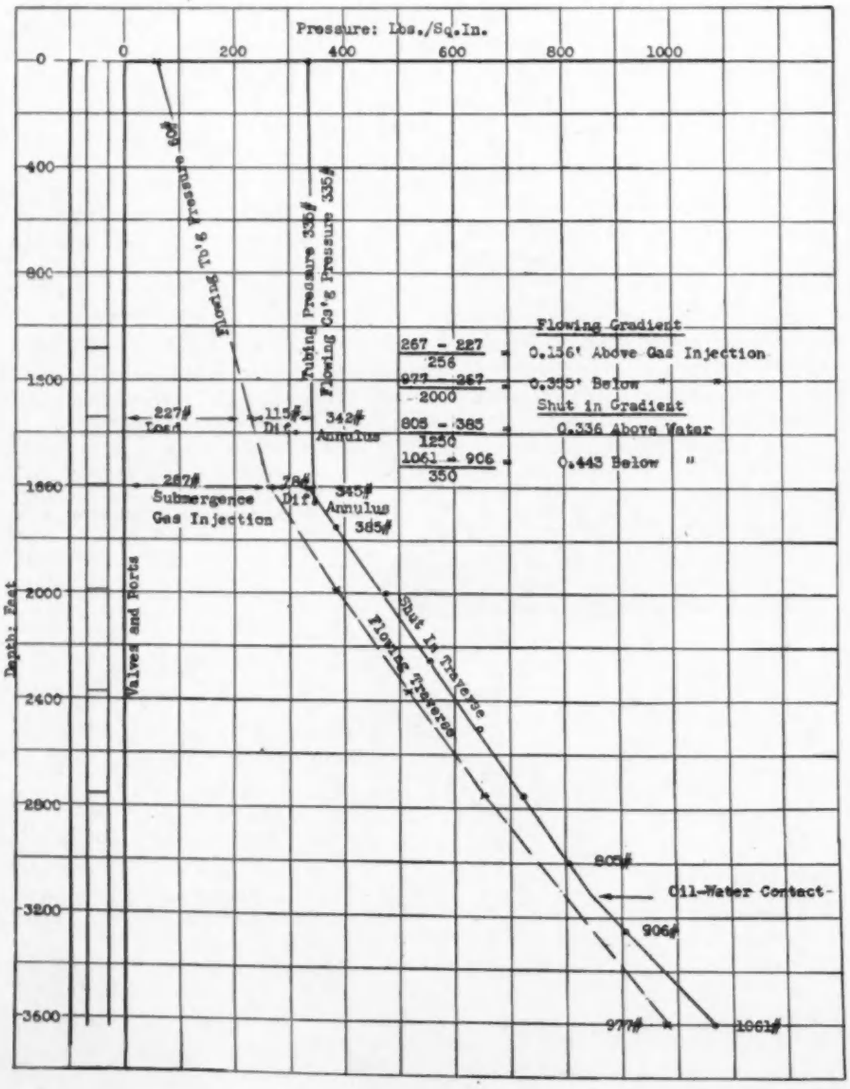

FIGURE 9

Shut in and flowing traverses of a gas lift well showing the point of gas injection; submergence and oil-water contact.

Cleanout and Workover Operations

The use of subsurface pressure data has removed considerable of the guesswork in some types of workover jobs. If the productivity factor of a well indicates good permeability and at a later date the productivity factor is considerably less, it indicates a plugging of part of the sand or liner; provided, of course, the well has not been "plugged back" to shut off water and the ratio of water, oil, and gas has not greatly changed. If there is no liner in the hole, the sand is partially plugged. This may be caused from cavings, paraffin, etc. The operator can definitely tell whether the well needs a cleanout job, or if only a change in lifting equipment is necessary. Often times a bottom-hole-pressure test will indicate that the productivity factor has not changed and that only a change in pumping or gas lift equipment is necessary, thus saving an expensive cleanout job. If, in completing a new well in an area of good permeability, satisfactory production is not obtained, there is usually good reason to believe that excessive filtration, improper perforating or some such condition is retarding the flow of oil into the well bore. We completed a well several years ago with cable tools and the well failed to produce satisfactorily although it was in an area of good flowing wells. Productivity factors were obtained on this well and on all offset wells. This data clearly indicated the oil was not coming into the new well at the rate of the offsets. The well was drilled a few feet deeper and subsequent production and bottom-hole-pressure tests showed it to be comparable to the offset wells.

The use of subsurface-pressure data for workover and cleanout op-

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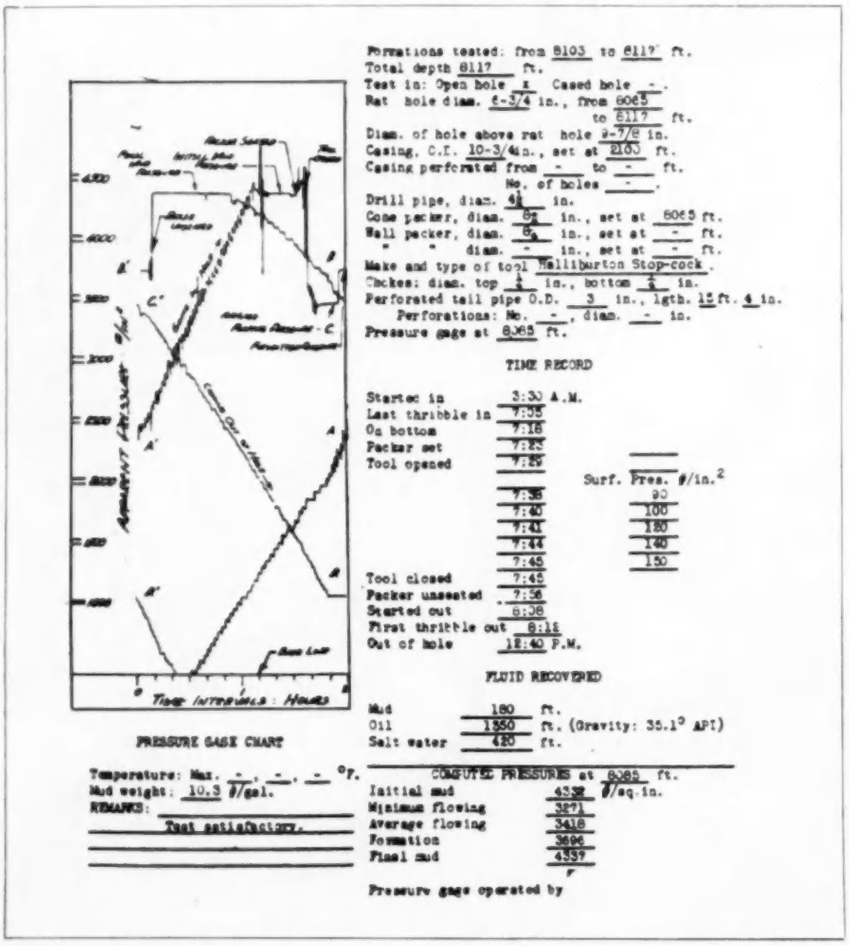


PRESSURE GAGE CHART

Formations tested: from 8103 to 8117 ft.
Total depth 8117 ft.
Test in: Open hole x Cased hole -.
Rat hole diam. 6-3/4 in., from 8065 to 8117 ft.
Diam. of hole above rat hole 9-7/8 in.
Casing, O.D. 10-3/4 in., set at 2160 ft.
Casing perforated from - to - ft.
No. of holes -.
Drill pipe, diam. 4½ in.
Cone packer, diam. 6¾ in., set at 8065 ft.
Wall packer, diam. 6¾ in., set at - ft.
" " diam. - in., set at - ft.
Make and type of tool Halliburton Stop-cock.
Chokes: diam. top ½ in., bottom ¾ in.
Perforated tail pipe O.D. 3 in., lgth. 12 ft. 4 in.
Perforations: No. -, diam. - in.
Pressure gage at 8065 ft.

TIME RECORD

		Surf. Pres. #/in.²
Started in	3:30 A.M.	
Last thribble in	7:05	
On bottom	7:16	
Packer set	7:25	
Tool opened	7:29	
	7:35	90
	7:40	100
	7:41	130
	7:44	140
	7:45	150
Tool closed	7:45	
Packer unseated	7:56	
Started out	8:06	
First thribble out	8:11	
Out of hole	12:40 P.M.	

FLUID RECOVERED

Mud	180	ft.
Oil	1350	ft. (Gravity: 35.1° API)
Salt water	420	ft.

Temperature: Max. -, -, -, - °F.
Mud weight: 10.3 #/gal.
REMARKS: Test satisfactory.

COMPUTED PRESSURES at 8085 ft.

Initial mud	4338 #/sq.in.
Minimum flowing	3271
Average flowing	3418
Formation	3696
Final mud	4337

Pressure gage operated by

FIGURE 10

Subsurface pressure record during drill-stem test.

erations becomes increasingly important as the field grows older. The question will often arise as to whether production decline is due to the natural decline in formation pressure or whether to plugging of liners, casing perforations or sand face. By a few bottom-hole-pressure measurements considerable guesswork can be eliminated, thus saving many dollars spent on useless workover jobs.

Drill-Stem Tests

The use of subsurface-pressure correlations in conjunction with drill-stem tests is an application which has only been in use the last few years. While this application will be of little use now in the East Texas field, it will have considerable application in wildcat or semi-wildcat wells of this section in the future.

All or part of the following information is obtained from pressure records during drill-stem tests.

1. A check upon the operation of the testing equipment.

2. Through the flowing formation pressure, the ability of a sand to produce.

3. Through the shut in formation pressure, the nearest possible measurement of the original or undisturbed reservoir pressure.

4. Through the actual mud pressure and the formation pressure, the margin of safety of a given mud weight.

Besides being of assistance in ordinary drill-stem tests of open formation, the pressure records are valuable in tests of perforation

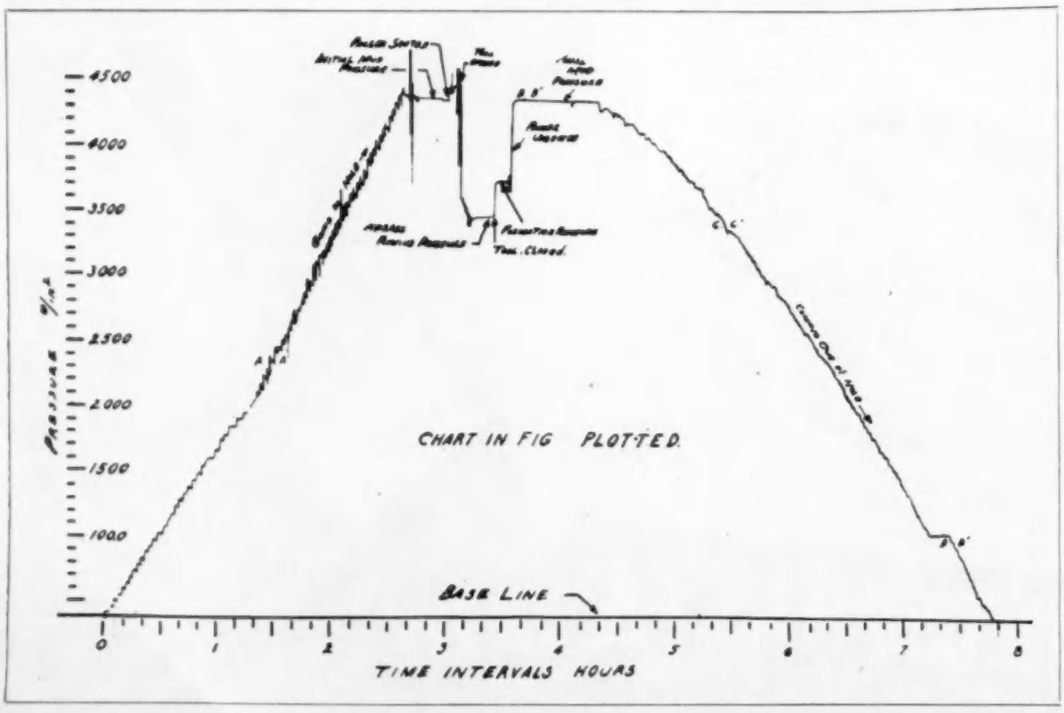
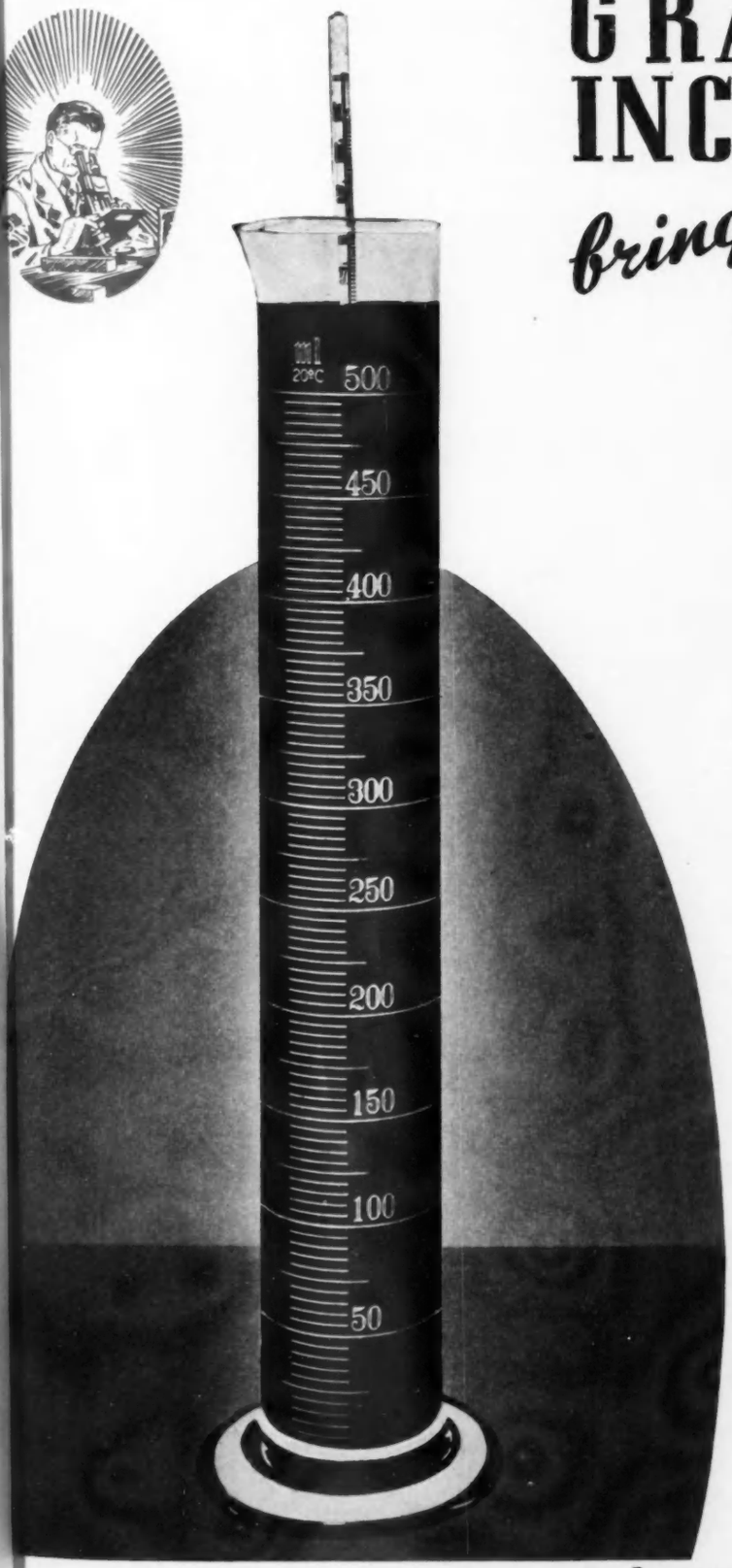


FIGURE 10A



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Almost every day Petreco is adding similar case histories to an already long list. A survey of your production may develop possibilities for additional profits that are equally desirable. This preliminary service involves no cost or obligation, and inquiries are invited.

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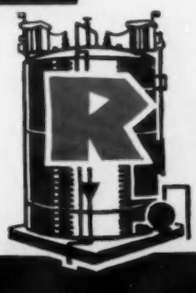

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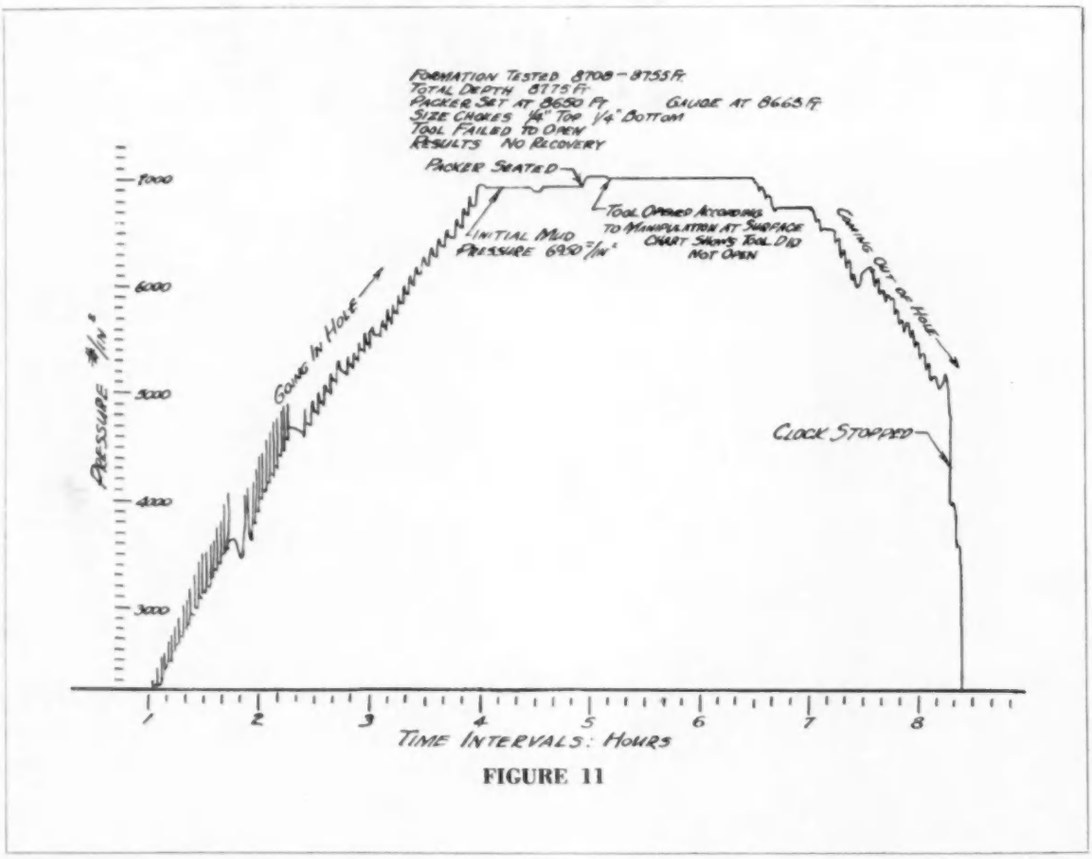

FIGURE 11

jobs, water shut-off jobs and in testing casing seats.

The subsurface pressure measurements ordinarily are obtained by placing a subsurface recording gauge in a lower extension of the perforated section of a drill-stem testing tool.

The importance of using a subsurface-pressure gauge in drill-stem testing cannot be stressed too much as this is the only means of definitely determining, under certain conditions, whether the tester has actually operated as it should.

Figure 10A was plotted from information shown by chart in Figure 10. Figure 10A shows the tool to have opened satisfactorily and test was O.K.

Figure 11 definitely shows the tool did not open since there was no abrupt drop in pressure. The pressure would have dropped had the tool actually opened when manipulated at the surface. No fluids were recovered on this test and had the pressure record not been obtained, the formation would have been assumed to be dry.

A selected bibliography has been placed at the end of the paper. There are, no doubt, many other valuable papers pertaining to this subject and it is not the intention of the writer that this bibliography be considered as complete.

Acknowledgments

I wish to express my appreciation to Mr. Bert Crowder and Mr. W. S. Morris for their aid in obtaining curves, pictures, and other data; also to Mr. Curtis Maxwell for his most valuable assistance in preparing the entire paper. I also wish to thank Humble Oil & Refining Company for granting permission to present this paper.

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The foregoing paper was presented at the East Texas Chapter of American Petroleum Institute, December 10, 1940.

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Soil Resistance Data Aid Electrolysis Studies

By W. G. WILSON, Engineer

Arkansas Natural Gas Corporation

SOIL characteristics which may be evaluated and tabulated for comparative purposes in studying pipe-line corrosion include texture, moisture and oxygen content, acidity, chemical composition, and resistivity. All these have direct bearing on the corrosiveness of the soil, and may in addition exert physical as well as chemical action on protective coatings and wrappings.

If it were possible to relate corrosion specifically and definitely to any one characteristic, it would then be comparatively easy to evolve formulas and procedures for the study and mitigation of corrosion.

From research or laboratory standpoints it may be possible to arrive at a fairly accurate analysis of soil with respect to its relative corrosiveness, but for field work, and for operators whose problems do not justify extensive laboratory apparatus and trained technicians, it is usually necessary to study soil conditions with a minimum of equipment and to relie extensively on experience and judgment.

The electrical resistivity of a soil is one of the most desirable qualities to ascertain, and once determined, reflects several other qualities. Soil resistances are useful in estimating the corrosiveness of the soil and as a guide for proper location and design of ground beds for cathodic protection installations, but resistance measurements should not be blindly utilized in evaluating the corrosive characteristics of a soil.

Resistivity or, conversely, electrical conductivity, indicates merely the ease or difficulty with which the substance under consideration will conduct an electric current. Most metals, for example, are better conductors (or have less resistance) than the most corrosive soils, yet in themselves are not corrosive.

The conductivity of a soil depends on the electrolyte present in it. An electrolyte may be considered simply as water containing substances which ionize, or dissociate, when in solution. These ions are electrically charged, are chemically very active, and readily react with other ions to form more stable combinations. Where conditions are such that these ions react with metal, as line pipe for example, corrosion or pitting of the metal will ensue.

Reflects Other Factors

Soil resistance reflects other factors and is not, in itself, positive indication of the extent to which corrosion will occur. Moisture is an essential condition, as without moisture there can be no solution of substances and hence no ionization. However pure water is a very poor conductor and if there is too much "fresh" water the solution may be so dilute that electrical conductance is very poor. Suitable chemicals are essential to furnish a supply of ions. It is well known that clean sand even though well saturated with "fresh," or reasonably pure, water has a high resistance and is non-corrosive.

Failure to secure complete correlation between soil resistances and salt content, acidity, pH values, and other factors for all types of soils indicates that such relationships are complex and not to be arbitrarily followed. It is questionable practice to set up definite soil resistance limits for the purpose of classifying the corrosiveness of soils. Limits which may be appropriate in one area, or for one type of soil, may be entirely inadequate in other areas. Also certain organic constituents of soils may be corrosive and yet ionize less readily, with higher measured soil resistance, than some less corrosive inorganic materials.

In spite of the limitations outlined above, soil resistance determinations are very valuable if utilized appropriately.

Where electric currents flow along any pipeline they tend to leave the pipe when two conditions are fulfilled: (1) a suitable potential difference tending to force the current from the line must exist, and (2) the resistance between the pipe and the soil must be low enough to be overcome by the force of the existing potential difference. If currents are of local galvanic nature the potential differences are usually small and hence these currents will be most active in soils of low resistance, which do not seriously impede the passage of the currents between the pipe and the soil. Long line currents, whether galvanic or stray, are usually motivated by higher potential differences. As the currents leave the pipe by the routes of least resistance, it follows that this will occur in soils of least electrical resistance, which may be considerably higher than would be expected. For example, a pipe line may traverse several miles of high resistance soil and then enter an area with soil resistances in the order of 2000 ohm centimeters and experience severe corrosion. On the other hand another line may be in very uniform but low resistance soil (in the order of 500 ohm centimeters) and yet suffer only minor corrosion. In this latter case the soil is so uniform that potential differences are not large. Hence comparative, as well as definite, soil resistances are important. Information of this sort is valuable not only in corrosion surveys of existing lines, but also for new pipe

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lines in determining routes and appropriate coating programs.

Soil resistance data is also important in the location and design of ground beds for cathodic protection, or forced drainage, units. There may be differences of opinion as to whether current density is the criterion of the extent of protection rather than critical potentials. But there should be no argument as to the desirability of keeping power costs at a minimum. A very large portion of the power requirements, sometimes more than 90 percent, is utilized in forcing the drainage current from the ground bed into the soil. Ground bed resistances are direct functions of the soil resistance. Thus if a 500 ohm centimeter soil can be utilized in preference to a 1000 ohm centimeter soil, the ground bed resistance will be cut in half, the power bill reduced nearly 50 percent, and equipment of lower capacity may be utilized. Or the ground bed itself may be materially reduced in size. These savings in cash outlay are very definite and worth working for.

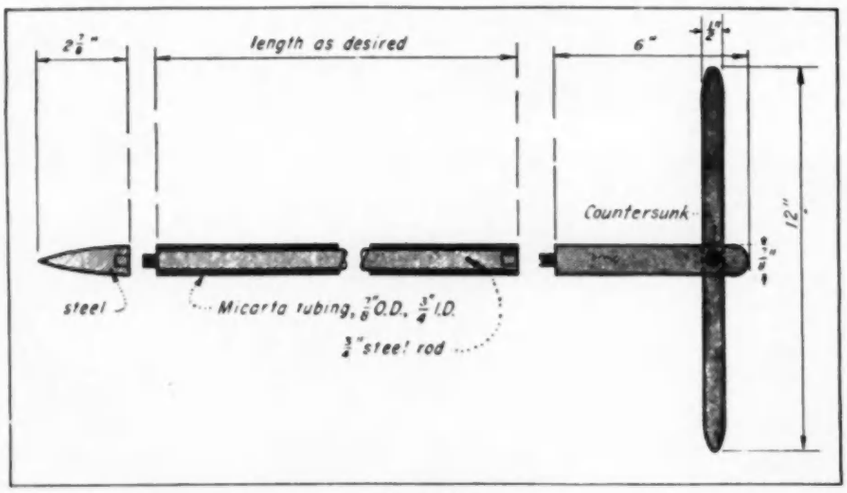

FIGURE 1
Detail of Soil Rod.

Resistivity determinations may be made with several types of equipment, which, to be of the most value, should permit the determination of useful information, should be reasonably accurate, should be simple and quick to operate, should be rugged and sturdy, and should be readily portable.

"Megger" equipment is probably the most accurate and reliable. Complete wiring diagrams and discusions of the method and equipment are readily available.[1, 2] In brief, a flow of current is forced through the soil from one ground rod to another ground rod some distance away. The fall of potential between two intermediate ground rods is then measured and the resistance of the soil may be calculated by a suitable formula. Some advantages of the method are: (1) Due to the use of alternating current, stray currents (direct) do not interfere with the measurement. (2) The method indicates the average soil resistance to a depth equal to the distance between the rods. Hence surface observations may indicate conditions at considerable depth without the necessity of boring deep holes or driving rods to a great depth. (3) The use of alternating current eliminates polarization at the electrodes. (4) The instrument is rugged, readily portable and easy to operate.

A second class is the "Shepherd rod" type of equipment, which is also adequately discussed in the literature.[3, 4] The Shepherd rod measures the resistance of the soil immediately adjacent to the ground rods. It is particularly suitable for testing in open ditches and for relatively shallow depths. It utilizes direct current so may be affected by stray ground currents. Also polarization occurs at the electrodes, although this is minimized by making the area of the cathode larger than that of the anode, thus reducing current density on the cathode.

The author has utilized a modification of the Shepherd rod principle for soil resistivity and ground bed resistance determinations. The equipment and procedure, in spite of certain inherent disadvantages, has many good features and has proven very satisfactory for this type of work. The equipment consists of an ohmmeter, two soil rods, and two leads.

In practice the rods are inserted, a suitable distance apart, in the soil to be tested and connected to the ohmmeter by the leads. The battery in the ohmmeter forces a flow of direct current from one rod through the soil to the other rod and thence back to the battery to complete the circuit. The hookup utilizes the Wheatstone bridge principle and by adjusting the variable resistance until there is equal flow in both branches of the circuit, as indicated by absence of current flow across the bridge, a condition is obtained whereby the total resistance of each branch of the circuit is the same. The variable resistance is appropriately calibrated, thus permitting a direct reading of the magnitude of the resistance of the soil.

The ohmmeter is light in weight and very ruggedly constructed. Four resistance ranges are available, permitting measurement of any resistance between 50,000 ohms and 0.5 ohm. The elephone circuit and buzzer, in addition to the galvanometer, eliminate difficulties due to polarization. For measurements in high resistance soils and for rough comparative readings the galvanometer hookup suffices. In low resistance soils the effect of polarization is readily observed by the behavior of the galvanometer needle and to secure accurate results the telephone circuit and buzzer should be utilized. Stray ground currents may so affect the meter as to render any observations valueless, as long as the stray current persists. However, the author, in the course of a great many resistance measurements, has noticed the effect of ground currents only a very few times—generally in the vicinity of an active ground bed—and always the behavior of the meter plainly indicated that conditions were not right and that the observations should be questioned.

The ground rods are shop made.

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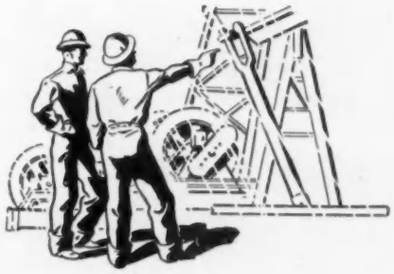

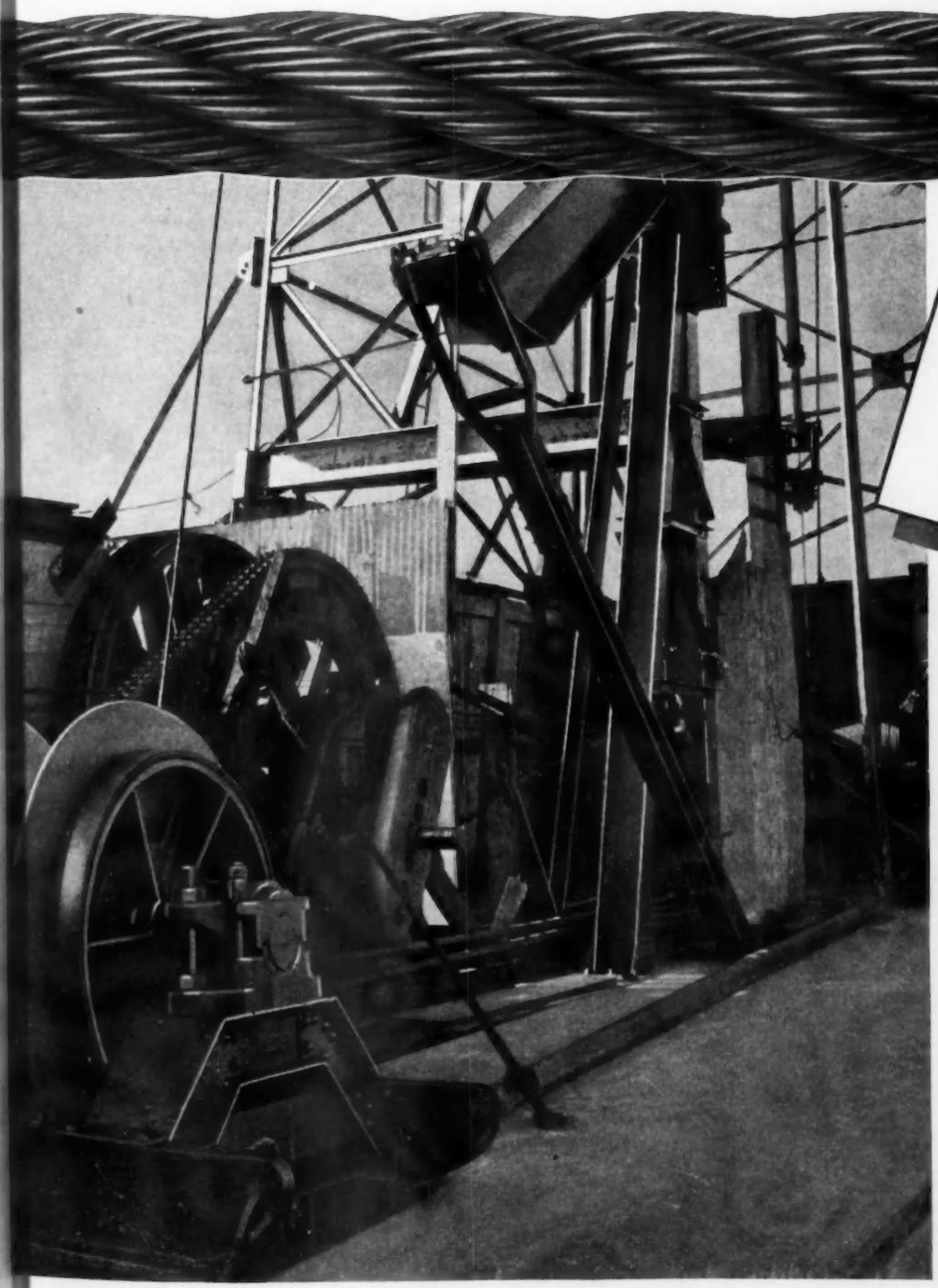

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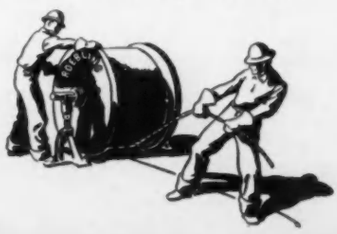

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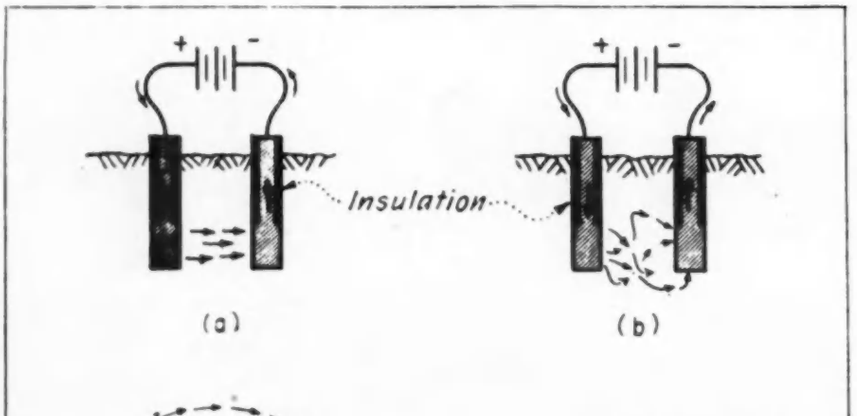

FIGURE 2
Assumptions Relative to Current Flow Between Electrodes.

Figure 1 gives details of construction. They are of rather heavy construction and are sectional. An over-all length of about four feet is convenient for most work, but when prospecting for suitable ground bed locations, enough sections may be inserted to permit testing to a depth of eight or ten or more feet. Rugged construction is essential to give sufficient rigidity and strength, particularly at the joints, when built up to more than usual length. Soil may be hard and the rods must be strong enough to function as "probe" bars in forcing a penetration into the soil.

As the results of soil tests are expressed in ohms per centimeter cube (standard form of expressing soil resistivity) rather than merely as ohms, and as the resistance (in ohms) varies with the dimensions of the electrode, the rods must provide a constant area for contact with the soil. For this reason all the rod, except the tip and the handle, is insulated from contact with the soil. As shown in Figure 1 this insulation consists of snug-fitted micarta tubing around the body of the rod.

The test leads terminate in battery clamps, which are clamped to the handle of the rod, or on the body of the rod above the insulation, to secure the required connection.

The point of the rod is perhaps most important. There should be enough taper to act like a wedge and secure firm contact with the soil at all points. The tip of the point should be sharp enough to facilitate penetration and blunt enough to withstand considerable battering against stones or other hard materials as the rod is forced into the ground.

Determination of a constant for the points, to permit conversion of total resistance, as measured in ohms, to specific resistance expressed in ohms per cubic centimeter, is necessary. Precise analysis of this problem is beyond the scope of this paper. The author uses a constant of four; that is, a measured resistance of 500 ohms is considered to indicate a specific soil resistivity of 2000 ohms per cc, which is believed to be approximately correct. As stated before, soil resistance determinations are of value principally when used comparatively. Thus, it is important to know that one soil compares to another in the approximate relation of, say, 500 to 1500 ohm centimeters, but it is less important to know precisely that the values are 487 or 525 instead of 500 and 1463 or 1506 instead of 1500. In the case of ground bed design, precise determination is desirable for proper application of ground bed formulas, but it is felt that other factors will yield as much discrepancy in calculations as a small error in resistivity determinations.

In the Shepherd rod method, the point of one rod (the cathode) has an area considerably larger than the other, to reduce polarization. The rods described herein are identical, no distinction being made between cathode and anode. It is believed that these rods are as satisfactory as the Shepherd rod type, and mathematical analysis, checking against a "standard," and checking against the "Megger" instrument all indicate that this assumption is substantially correct.

The calibration factor for these rods may be determined analytically. The so-called standard of resistivity is based on the cube. If the length through which the current passes is two units instead of one, the measured resistance is doubled. If the cross-sectional area of the conductor is doubled, the measured resistance is halved. In short, the measured resistance is a function of the ratio of length to cross-section of the conductor. If this ratio be known the specific resistance may be readily computed.

When using these rods the soil is the conductor and it is necessary to determine the equivalent of the dimensions of that portion of the soil which conducts the current. This is difficult of determination but the use of several assumptions simplifies the problem.

First assume that the points of the rods are cylindrical instead of tapering toward the tip and that each portion of the current travels generally in a plane perpendicular to the cylinder as indicated in Figure 2 (a) rather than in some haphazard manner as shown in Figure 2 (b). If this assumption is reasonable the problem may be reduced to two dimensions for further study.

In a plan view, with uniform soil resistivity, the current flow is probably somewhat as indicated in Figure 2 (c). If the rods are spaced far apart the current probably leaves and enters the rods quite uniformly around the circumference. If spaced close together most of the current flows directly be-

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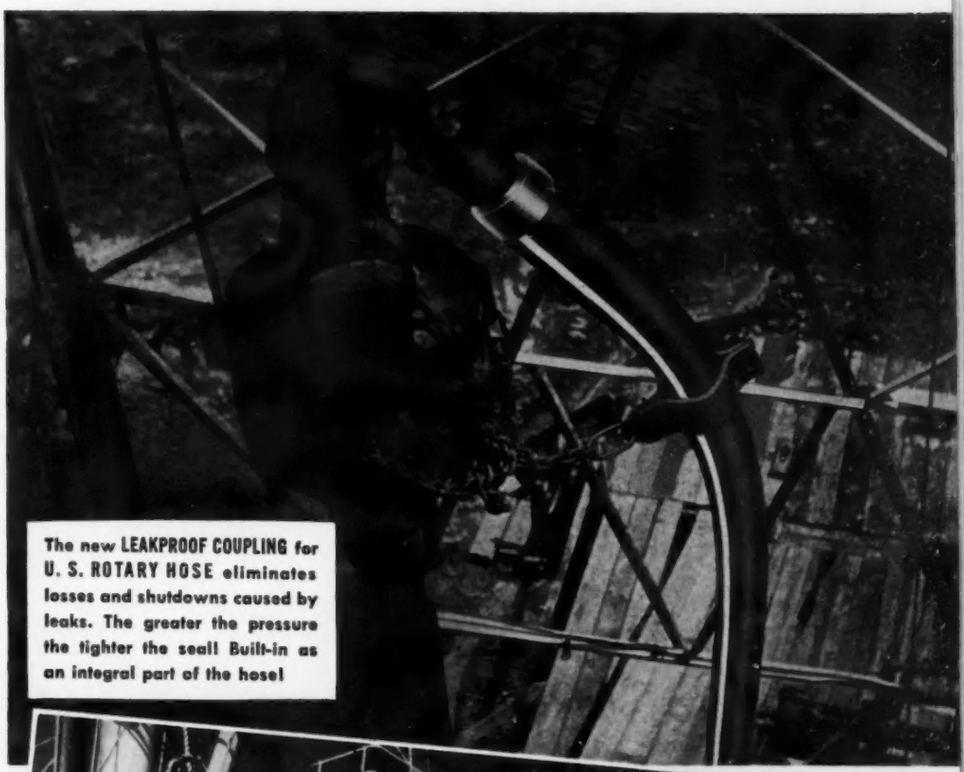

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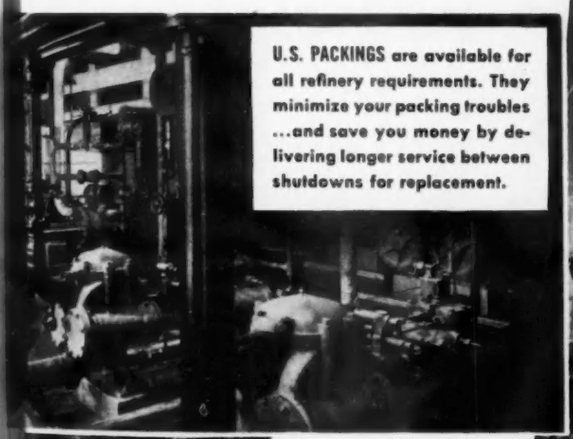

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tween the rods along the shortest path.

The second assumption is that the current distribution, for usual rod spacing ranges, is the *equivalent* of conditions indicated in Figure 2 (d). With this assumption it is possible to determine the *equivalent* of the dimensions of the conductor.

The average length (L_A) of path of the current is:

$$L_A = \frac{\frac{\pi}{2}D + D - d}{2}$$

The total area (A) through which the current passes is:

$$A = \frac{\pi}{4}(D^2 - d^2) + dD$$

The average width (W_A) of the conductor, obviously, is:

$$W_A = \frac{A}{L_A}$$

We are interested primarily in the relation of length to width, which together with measured resistance, will enable calculation of specific resistivity. This ratio is:

$$\frac{L_A}{W_A} = \frac{L_A}{\frac{A}{L_A}} = \frac{(L_A)^2}{A} = \frac{\frac{1}{4}\left(\frac{\pi}{2}D + D - d\right)^2}{\frac{\pi}{4}(D^2 - d^2) + dD}$$

If we assume that the soil rods are of unit diameter and assign various multiple values to the distance between rods we may then solve the equation and determine the value of the ratio $\frac{L_A}{W_A}$. Table 1 shows these values, which are also shown, in graphic form, in Figure 3.

Inspection of the tabulation and of the graph indicates that there is only a small change in the value of the ratio when the rods are spaced more than 12 or 14 diameters apart. It indicates that the diameter of the rods is of little importance compared to the distance between the rods. With 20-diameter spacing the value of the ratio is 1.9, which means, in terms of two dimensions, that the length of the conductor is 1.9 times the width and hence the measured resistance should be divided by 1.9 to reduce it to specific resistivity.

Since diameter seems to be unimportant, the length of the portion of the rod in contact with the soil should be a major factor to consider. Reverting, now, to three dimensions and remembering the first assumption that current leaves the rod in a plane perpendicular to it, it is apparent that the measured resistance will be inversely proportional to the length of the rod point. The centimeter cube is the standard dimension for specific resistivity. If the rods were one centimeter long, the measured resistance divided by 1.9 (for spacing equal to 20 diameters) to correct for excess length of current travel over width of conductor, would give the specific resistivity. If the rods were five centimeters long, the measured resistance would be multiplied by five and divided by 1.9. The formula, obviously, is:

$$K = \frac{MW_A}{L_A} = \frac{M}{\frac{L_A}{W_A}}$$

Where K = constant for the rods
M = effective length of rod, in centimeters
W_A = average equivalent width through which current flows
L_A = average equivalent length of current flow
$\frac{L_A}{W_A}$ = ratio of length to width (from Fig. 3 or Table 1)

This formula, when applied to the soil rods described above, yields the following constant, assuming 1.8 as the $\frac{L_A}{W_A}$ ratio for average spacing practice:

$$K = \frac{(2.875)(2.54)}{1.8} = 4.06$$

A value of four is used for easy calculation. This derivation neglects the fact that the rod tip is not cylindrical, but tapers to a point.

The above analysis is based on certain assumptions which may not stand rigid inspection. It is probable that a more precise analysis would develop a slightly different constant. However, it is sufficiently accurate for field work, with the possible exception of design of ground beds.

TABLE 1

Diameter of Soil Rods	Distance Between Rods (Center to Center)	Ratio of Length to Width
d	D	$\frac{L_A}{W_A}$
1	2	.98
1	3	1.21
1	4	1.37
1	6	1.58
1	8	1.67
1	12	1.79
1	20	1.90
1	40	1.99
1	100	2.06

It may be noted that these soil rods are essentially ground beds and may be analyzed as such.

Certain field tests corroborate the results, if not the reasoning, of the above analysis. The effect of rod spacing may be readily observed by testing uniform soil, or bodies of salt water, using varying spacing. There is little change in measured resistance with spacing of over 10 or 15 diameters.

Checking measurements against the "Megger" is difficult, due to the entirely different principles involved. However, a check was made in a reasonably uniform, but high resistance, soil. The soil was logged at six-inch intervals down to a depth equal to the spacing of the "Megger" electrodes and the average soil resistivity computed. The result was in quite close agreement with the value as determined by the "Megger."

A so-called "standard cell" was constructed substantially as shown in Figure 4. This cell was nearly equivalent, in dimensions, to a cube, and was connected to the ohmmeter, the two steel plates functioning in a manner similar to soil rods. In the field, when apparently uniform soil was encountered, the cell would be charged with soil, and the resistivity determined for comparison with the results obtained with soil rods. Because of the difficulty of securing average soil samples, as well as compacting the sample exactly as in the undisturbed state, an absolute check would be a matter of chance. However, comparison of the results obtained by the two methods indicated that the calculated constant was at least approximately correct.

Incidently, the standard cell, as described above, offers a convenient method for testing small amounts of soils, or soils difficult to reach, as for example, soil auger samples from any depth penetrated by the auger.

Possible Uses

The equipment described and including the so-called "standard cell," is very valuable for electrolysis work. Some of the possible uses are listed herewith:

1. In routing right-of-way for proposed pipe lines, possible alternative routes may be tested for soil resistivity, as an indication of probable corrosion. For this type of work it is possible to log the resistances according to depth, by six inch or one foot increments, to

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● In practically continuous service since Jan. 3, 1940, this Waukesha-powered Oilwell CT-1715 Rotary Drilling Unit owned by a prominent drilling contractor (name on request) has been drilling wells in the Illinois Basin.

During all this time the rig has never once been shut down due to any difficulty with the engine which drives the rotary table. A Waukesha Model 6-GAKU, it operates on natural gas. With its Twin Disc hydraulic torque converter this power unit gives the rotary table all the flexibility of steam.

There are two other Waukesha GAKU Engines on this rig. Compounded they drive the pump and draw works. As the rig was originally equipped, it had only these two power units which were compounded and used for drilling 2000 ft. wells. In the past two years they have drilled more than fifty wells in the Illinois Basin.

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a depth of, say, five or six feet if the ditch is to be four feet deep. Knowing the sequence of resistances, normal tests to a depth of one or two feet may indicate what is to be expected at pipe depth. The complete log should be made at frequent intervals to determine if the soil sequences are uniform, surface to such an extent that this stratum occurs at a depth of four feet, and the pipe is resting directly on the low resistance soil, severe pitting will probably occur on the bottom of the pipe. Precise logging with soil rods will detect this condition, whereas it is doubtful if a one foot difference in depth of a on existing lines. For electrically continuous lines they may be used in conjunction with line current surveys. Thus, line current surveys may indicate current loss in, say, a 1000-foot section of line. It might be possible, by complete survey of the entire section, to definitely locate the "hot spots" within a few

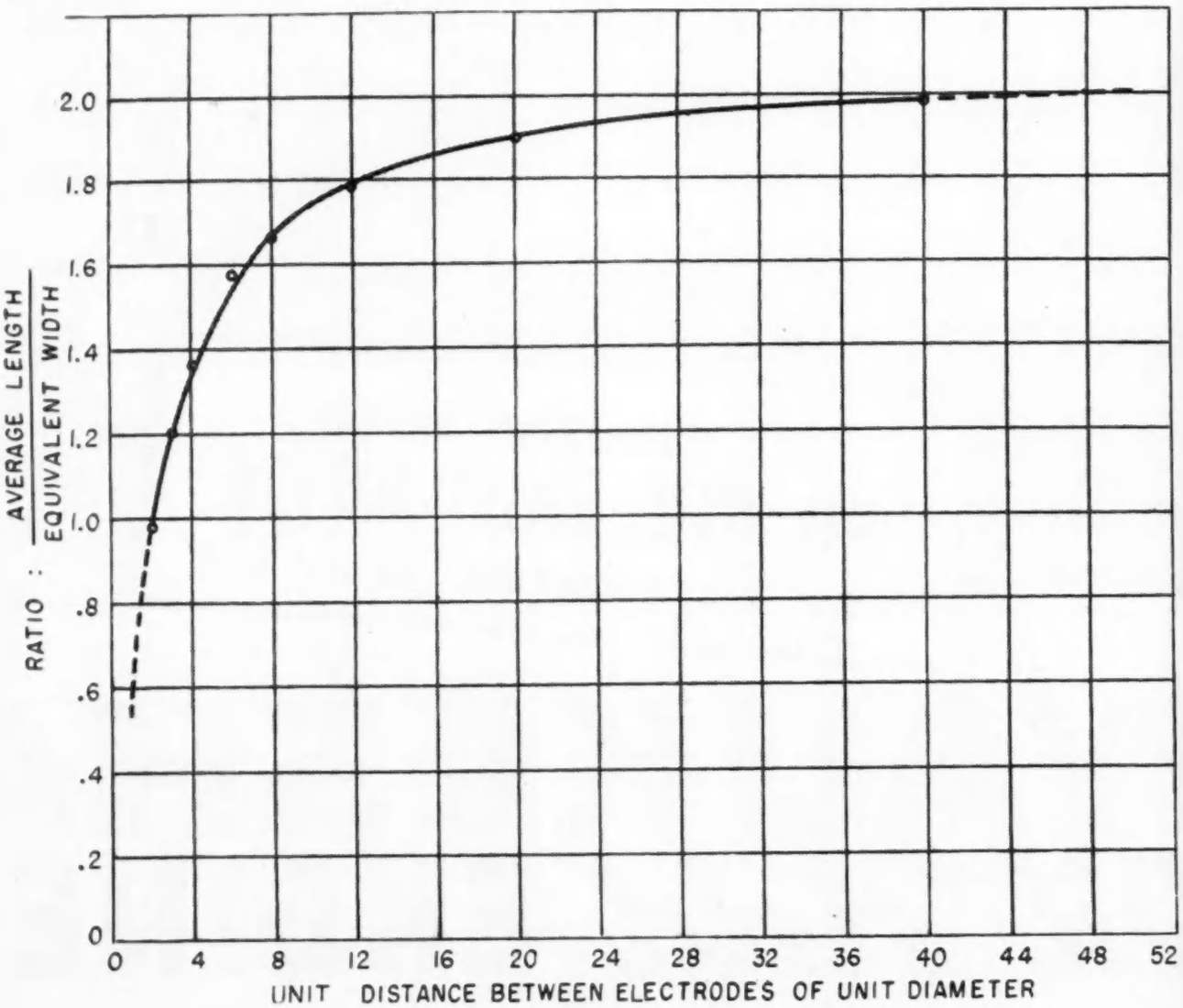

FIGURE 3
Ratio of Conductor Length to Width.

whenever changes of soil types are encountered.

It is recognized that a very thin stratum of low resistance soil may be very corrosive to the pipe if in direct contact with it. Suppose such a stratum normally occurs at a depth of five feet. In a four-foot ditch the pipe would be isolated from this stratum by one foot of higher resistance soil and probably would not be seriously corroded. However, if erosion, or some similar process, has altered the ground very thin stratum would be noticed with "Megger" observations.

2. In pipe line construction, resistance readings may be made in the walls and on the bottom of the open ditch. When this information is correlated with visual inspection and practical experience rational recommendations may be made for the amounts and types of protective coatings best suited to conditions at any point.

3. Soil resistance tests are valuable in making electrolysis surveys feet. However, soil tests at short intervals would, in most cases, reveal the same conditions—and do it much quicker and easier.

For coupled lines, line current surveys are not practical and the engineer, in the absence of leak records, must rely on soil resistivity data, and to a lesser extent on soil potentials, as an indication of probable corrosive areas.

Where coatings are of a high resistance type, and in good condition, a very small amount of cur-

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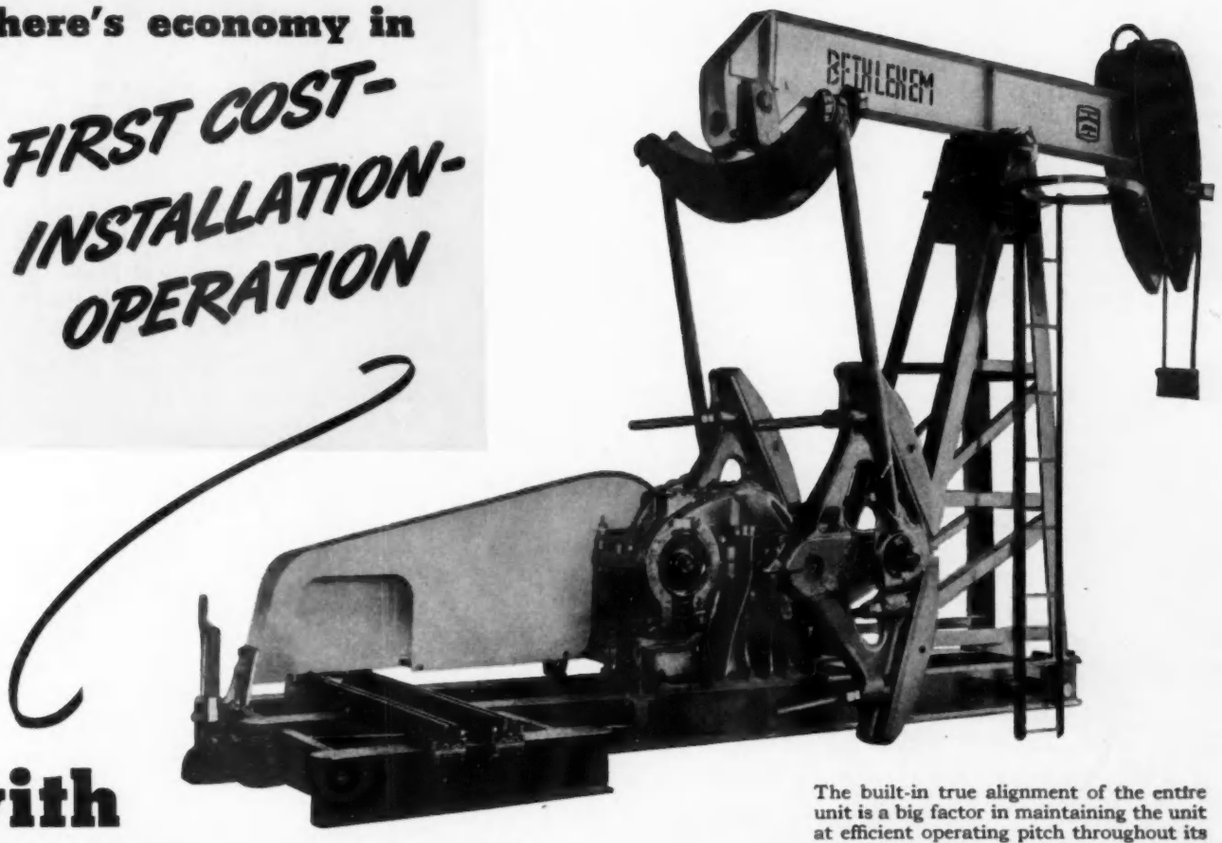

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rent loss concentrated in a few "holidays" may cause severe pitting, yet be hardly noticeable in a line current survey. Here, again, soil resistivities are valuable in locating these areas, and others of a similar nature which may give serious trouble at a later date when the pipe coating will have deteriorated to a greater extent.

4. The equipment is useful in prospecting for suitable ground bed locations, also. Precise logging of the soil probably furnishes more desirable information than the "average" values as determined by the "Megger." In the case of horizontal ground beds, where relatively shallow installations are made, it is very easy to thoroughly explore and log soils throughout the area involved and determine the optimum depth and location for the pipe.

In the case of vertical ground beds, soil strata of varying resistivity are generally encountered. Consider, for example, an hypothetical case where the soils would be logged as indicated in Table 2.

TABLE 2

Depth (feet)	Resistivity (Ohms per cc.)
0-2	10,000
2-4	7,000
4-6	3,000
6-7	500
7-9	1,200
9-16	1,000

It is apparent that current density, and resulting dissipation of the metal, will be from to 2 to 2.4 times more rapid in the 6-7 foot section than in the 7-16 foot sections. This means that for a vertical pipe ground bed designed for, say, 10 years that in five years the pipe will be eaten in two at a depth of six or seven feet and that the lower section will then be of no value. In this case it might be more economical to install a horizontal ground bed at a depth of six or seven feet. Or it might be advisable to wrap, or otherwise protect, the section of pipe adjacent to the 500 ohm soil (at the sacrifice of a portion of of the effectiveness of the ground bed) in order to ensure full life of the lower portion of the ground bed. This illustration indicates the desirability of having a complete and precise log of the soils involved.

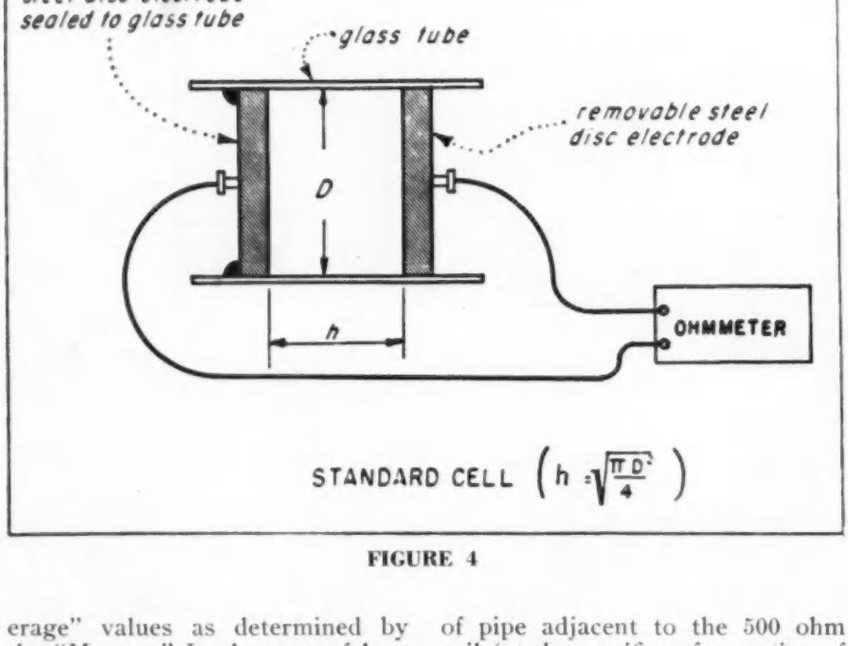

FIGURE 4

Soil rods, when extra sections are inserted, may be used to a depth of 10 to 20 feet, depending on soil conditions. In this connection it is possible to use one short rod at a depth of three or four feet, as a reference electrode, and use the long rod as an exploring electrode for greater depths. This procedure will definitely reflect changes in soil resistivities encountered, such as illustrated in Table 2. However, the relationships involved when using an exploring electrode have not yet been sufficiently analyzed or field checked to permit usage for determining definite resistivities of the soils encountered.

Particularly at greater depths, it may be more practical to log the soils by securing samples with a soil auger and testing them in the standard cell—as previously described.

"Megger" equipment can determine average resistivities to practically unlimited depths. However this advantage may be more theoretical than practical for average work.

5. The ohmmeter may be used in testing the resistance of temporary or permanent ground bed installations. The procedure is to use two appropriately spaced auxiliary grounds and measure the three resistance combinations. Thus let G, A, and B represent the ground to be tested and the two auxiliary grounds, and GA, GB, and AB represent the measured resistance, in ohms, of these combinations. The fraction $\frac{GA+GB-AB}{2}$ expresses the resistance of G, the ground to be tested. Low measured resistances reduce the effect of errors, or rather lack of precision, in reading the meter. For this reason bare steel rods, with no insulation, are used in preference to the soil rods as auxiliary grounds.

An active, or recently active, ground bed is polarized and earth currents are present so this method cannot be used satisfactorily in such cases. The "Megger" type of equipment utilizes a-c. current and thus can measure resistances of active ground beds—hence it possesses an advantage in those cases.

6. It is recognized that moisture content has a bearing on resistivities and corrosion. Soil samples may be prepared with various moisture content and tested in the standard cell. Thus in a dry summer, field tests may be made to determine approximately what conditions will prevail during the wet season—or vice versa.

In summary, the ohmmeter, soil rods and other equipment described herein, in spite of certain limitations, generally meet the requirements outlined previously; permits the determination of a wide variety of useful information, is reasonably accurate, simple and quick to operate, and is rugged, sturdy and readily portable.

A third very important reason why Mission Plug Valves give satisfactory service longer

That groove in the body goes half way around the port. Another half-circle groove is cut on the core. When the valve is closed, these two half-circle grooves join to form a complete circle around that port. This insures uniform lubrication and a perfect seal.

Similar grooves surround the opposite port. When opening or closing the valve, no part of any groove crosses the body port opening. This prevents "washing" out of the grease.

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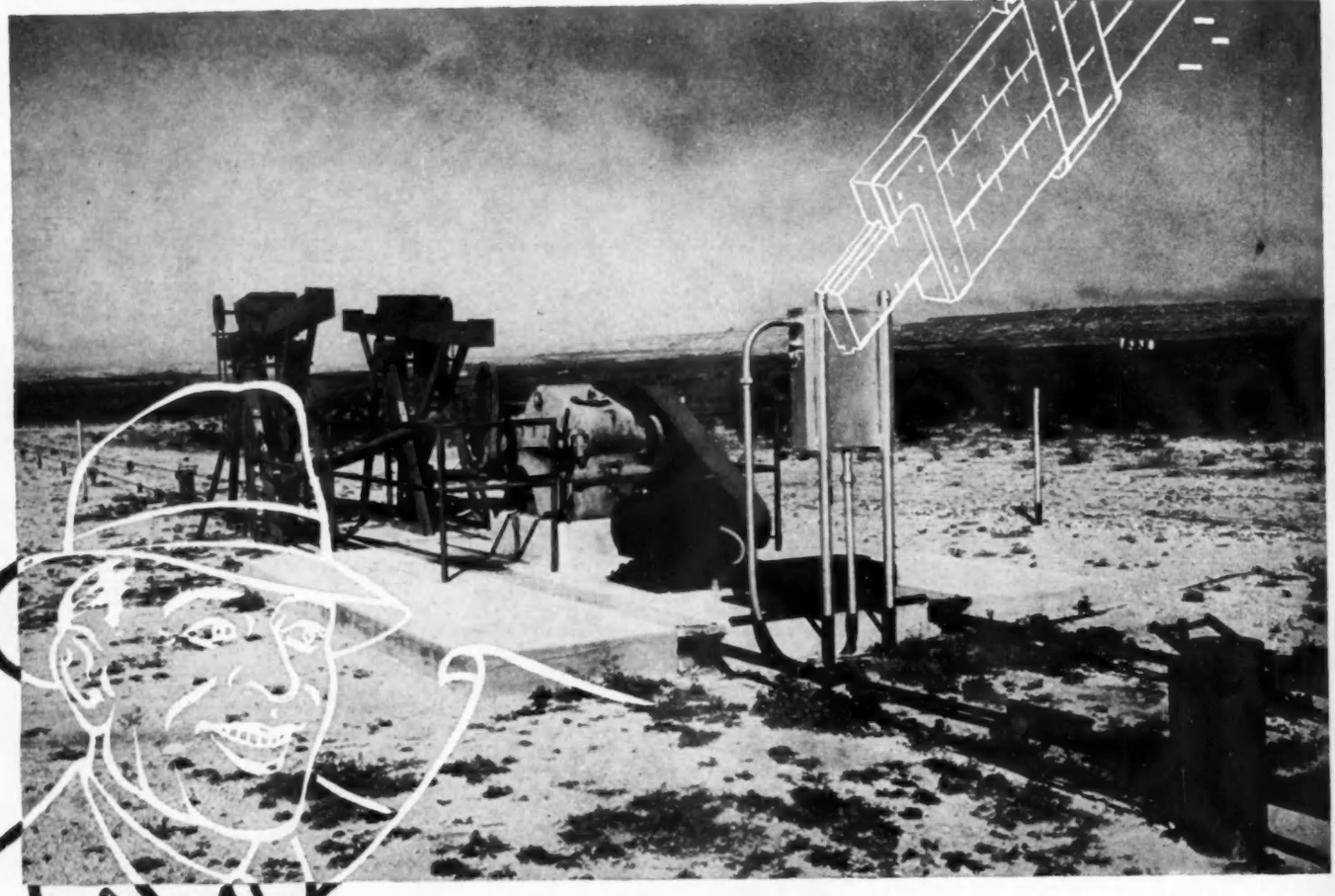

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HIGHLIGHTS IN THE WEEK'S NEWS

Washington

Cole Group Sets Hearings on Defense Production Capacity

An exhaustive investigation of the defense production capacity of the petroleum industry, particularly with respect to high-octane aviation gasoline and other special products, will be initiated early next year by the oil subcommittee of the House Interstate and Foreign Commerce Committee.

Launching of the survey was announced by Representative William P. Cole, Jr., chairman of the oil group, who first called a hearing for December 16. This hearing was later postponed, and Cole intimated that it may be necessary to delay it until after the new Congress convenes January 3.

Cole disclosed that the study was being undertaken at the request of President Roosevelt and the National Defense Advisory Commission, Edward R. Stettinius, commissioner in charge of the raw materials division of the commission, and William S. Knudsen, production chief, will be the first witness to testify. The program thereafter has not been mapped out definitely, but it is probable that other administration officials interested in defense production, representing the War and Navy departments, will be heard, and possibly oil-company executives who desire to discuss the question from the standpoint of the industry.

The oil subcommittee had planned to submit its report on the lengthy investigation of the situation in the oil industry, which it undertook more than a year ago at the request of the President, before final adjournment of the current Congress. It was generally understood that the document would be in the nature of a "progress report," probably without recommendations for action on the Cole bill, carrying the recommendations of Secretary of the Interior Harold L. Ickes for federal control of production.

It was explained that when the investigation was concluded the national defense program had not yet gotten under way and the problems which have since arisen, particularly with respect to aviation gasoline, were not then apparent. Accordingly, when the matter was brought up by President Roosevelt, it was decided to undertake the new study so as to avoid the possible necessity of later having to go over the same ground which is to be covered in the proposed report.

The hearings are expected to go deeply into the present situation in the oil industry from the standpoint of production for military purposes, and the extent to which it can keep abreast of the increased needs expected as the Army and Navy expand under the defense program.

Aviation Gasoline Resources Studied by Bureau

A survey of our aviation gasoline resources was one of the more important projects undertaken by the United States Bureau of Mines during the past year, it was disclosed last week in the annual report of Dr. R. R. Sayers, director, to Secretary of the Interior Harold L. Ickes.

The survey was one of a number of tasks undertaken by the bureau in connection with the national defense program, and its findings were reported to the National Defense Advisory Commission for consideration in making plans for the production and storage of high-octane aviation fuel.

Routine work of the bureau continued as usual, Dr. Sayers reported. Engineers studied energy relationships to find how the greatest amount of petroleum can be produced with the least waste of natural energy, oil and gas; subsurface and surface samples of oil and gas mixtures were collected from flow systems of wells and analyzed; field tests were made with the Bureau-A.P.I. pressure core barrel and operation of that instrument was improved; laboratory determinations of characteristics of hydrocarbon mixtures were continued, and studies were made of one of the older Oklahoma fields that helped to explain why many redrilling campaigns in similar areas have been successful.

Nearly 9,500,000 cubic feet of salable helium was produced during the fiscal year which ended June 30, last, an increase of about 50 percent over 1939, approximately 84 percent of the output being supplied to government agencies and the remainder being sold for medical, scientific and commercial use, it was stated.

Dr. Sayers pointed out that during its operating life of a little more than 11 years, the Amarillo plant has produced 100,012,000 feet of helium, less than 50 percent of the potential output at rated capacity.

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Allowables

Texas Purchasers Reaffirm December-January Needs

Purchasers, attending a special proration hearing called by the Texas Railroad Commission last week, reaffirmed nominations on which the current 60-day production order was based. Purchasers who had offered to buy Texas oil from particular fields sent representatives who told the commission they are willing and ready to buy the oil. In a few cases, purchasers asked for reductions, but they were offset by increases requested in other cases.

Most representatives left the hearing with one question on their minds: "Why was the hearing called?" The question was never answered satisfactorily.

One issue of importance was developed at the hearing. Maston Nixon, representing Southern Minerals Corporation, declared that conditions at Corpus Christi were serious, and that the difficulties might soon spread throughout the Gulf Coast area and into Louisiana. There are two problems which seem to defy solution; at least, they are beyond the scope of the authority vested in the commission.

Nixon reported that recently tanker rates have increased beyond reason. They are up 150 percent, and moreover, it has become virtually impossible to obtain enough ships to handle the oil. He said that he had been advised that many of the fastest tankers had been sold or leased to England, or else called in by the United States Navy to serve in the defense program.

This scarcity of bottoms, Nixon believes, will soon confuse the Gulf Coast situation further. It would apply to all oils handled in this manner, and much of the East Texas crude now being shipped coast-wise may pile up in terminals at Gulf Coast ports.

Distillate Situation Disturbing

The other hazard arose from the increasing production of distillate from distillate fields, recycling and repressuring operations. There is no statute under which production from these plants can be controlled in any way by the state. So long as the operation is conducted without waste, it is beyond the powers of the commission.

In the Corpus Christi area, Nixon said, there now is produced about 11,000 barrels daily, and he thought the only hope of controlling this production now would be through a cooperative effort on the part of oil producers and recycling plant operators.

He volunteered to curtail production from the properties of his company if the recycling plant operators would join in such a program. He said that other producers of crude agreed with his suggestion, and would join in such a program.

Nixon asked for discussion of the matter before the commission, but Commissioner Ernest O. Thompson pointed out that since an act of the legislature would be required to control the distil-

Price Cut Called Texas State-Wide Hearing

O. D. ROBINSON
President, Republic Oil Refining Company, New York.

Dan W. HOVEY
Vice President and General Manager, Republic Oil Refining Company, Houston.

late problem, and the commission had no authority over the tankers, the matter was beyond the call of the hearing.

Amsco Pipe Line Company said that it is still trying to sell the light oil it has at reduced prices. The oil comes from Plymouth, Taft, East White Point, Luby, Saxet and Clarkwood. The company does not want to buy any light oil, but is now getting 5000 barrels daily under contract from these fields.

The Luby oil is being sold to Humble Oil & Refining Company now, but on the basis of a day-to-day contract. This plan is unsatisfactory to Amsco Pipe Line Company because of the uncertainty of the market, and at the hearing Humble Oil & Refining Company said it did not nominate any more of the Luby crude and did not want more.

D. W. Hovey, speaking for Republic Oil Refining Company, whose price cut initiated events that precipitated the hearing merely stated that his company wished to continue buying the oil that it was getting now.

The three companies were the principal ones concerned with conditions in the Corpus Christi area. Nixon pointed out that while the rest of the state seemed in good condition, he thought the Corpus Christi area was a weak spot which needed attention. No solution of the problem was offered.

Increases Asked

Gulf Oil Corporation continued its fight to get more crude from West Texas fields to which it is connected. The company asked for an additional 15,000 barrels daily, and efforts of the commission to obtain the oil from other companies represented at the hearing brought no results.

Sinclair Prairie Oil Company asked for increases at Bonita and Walnut Bend, where it is a large producer. Company officials pointed out that a large volume of the oil formerly available in K-M-A has been taken over by another pipe line, and that the company was now having difficulty in obtaining enough oil to supply the demand.

The Texas Company asked for a reduction in its light crude nominations, reductions which include 4000 barrels of East Texas crude and the remainder from Darst Creek, Hamman, Loma Novia, Corpus Christi and Thompson. The company is now importing about 24,000 barrels daily from Louisiana. Its heavy crude nominations were firm.

As the hearing was concluded within two hours, operators wondered what the commission might plan to do. In his opening statement, Thompson had pointed out that Texas production was approximately 36,000 barrels daily in excess of estimates of consumer demand for Texas oil furnished by the United States Bureau of Mines.

"The commission intends to keep Texas within the bureau estimates," Thompson said.

It should be pointed out in this connection that the Texas production, upon which this calculation was based, is the allowable oil assigned through the commission's proration schedule. It does not include distillate production, which is some 21,000 barrels daily, according to commission estimates, nor does it include natural gasoline production.

Both natural gasoline and distillate compete in the market with crude derivatives and, therefore, in making any estimate of demand it should be considered. This represents the difference between the estimate of production supplied by the bureau and those of the commission, which are normally based on crude oil production alone.

By the addition of one shut-down day during the remainder of December, the commission could readjust its allowables to conform more exactly with bureau estimates. Reductions might be effected in some fields, but these would not be very large, as operators attending the hearing, in most cases, wanted all the crude and more than is allowed now.

Most of the oil men who attended the hearing were of the opinion that the December order issued by the commission was better than any recently issued, in that an effort had been made to redistribute production more equitably among comparable fields. They thought also that there was no need to revise the entire proration order because supply and demand were as nearly in balance as could be expected.

Courts

Supreme Court Studies East Texas Proration

Validity of a Texas Railroad Commission order prorating production in the East Texas field was argued before the United States Supreme Court last week in an action brought by Rowan & Nichols Oil Company and Humble Oil & Refining Company.

James P. Hart, assistant attorney general of Texas, told the court the issues were the same as in a case decided in favor of the commission last June 3 by the court. In that opinion, the court said "it is not for the federal courts to supplant the commission's judgment even in the face of convincing proof that a different result would have been better."

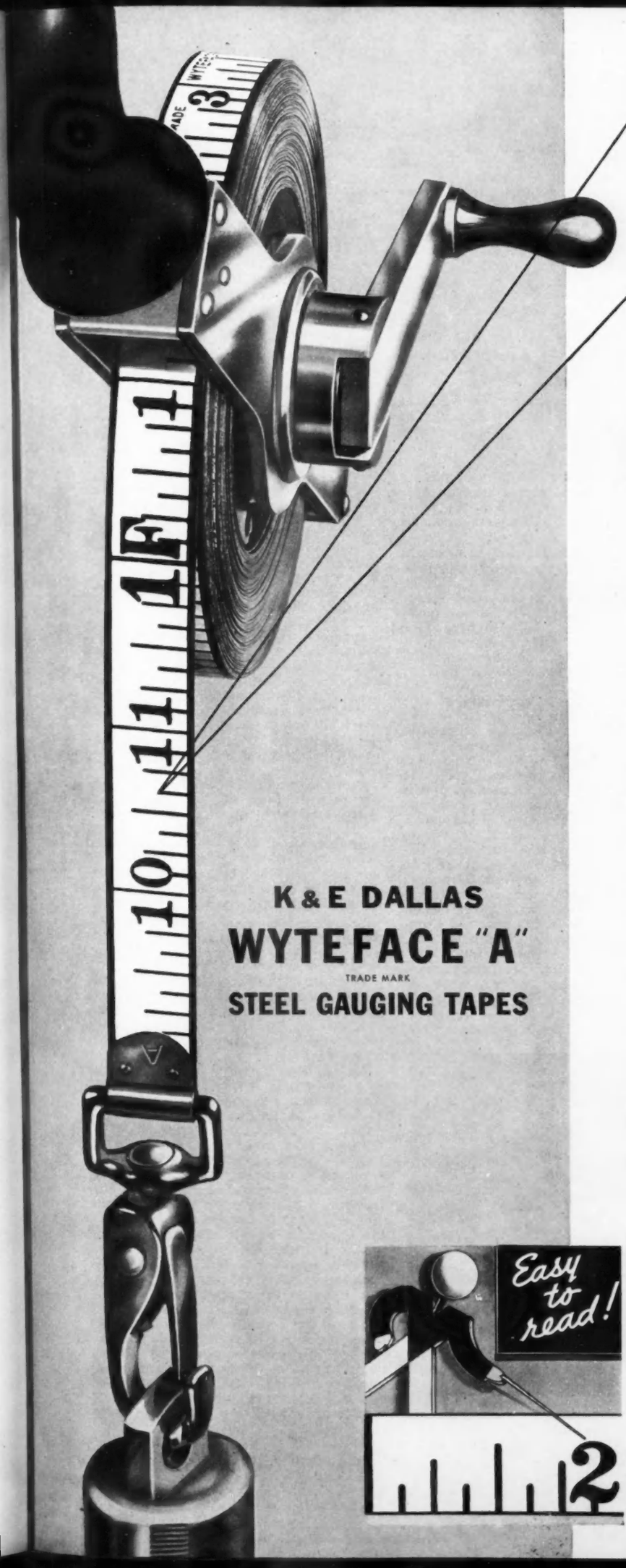
Dan Moody, Austin, and Hines Baker, Houston, representing the companies, argued that the litigation differed, and that a different ruling would be justified. Moody said that orders changed every 30, 60 or 90 days "do not distribute on a reasonable basis and result in confiscation." When asked by members of the court why the June 3 order did not cover the present controversy, Baker said, "We are somewhat mystified as to what the position of this court is."

The order before the court last week, which the court took under advisement, was enjoined by a three-judge federal court at Houston, and the commission appealed to the high court. It limited production in the field to 690,000 barrels of oil daily.

Chicago Court Throws Out Trust Damage Action

A motion to strike a suit brought to force 17 major oil companies to account for damages allegedly resulting from anti-trust law violations was sustained by Federal Judge Michael L. Igoe in Chicago last week.

Weymouth Kirkland, counsel for Standard Oil Company (Indiana), told the court during three days of argument that the suit was improperly brought as a "class action." The suit was brought by Weeks-Marland Oil



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Company and Sterling Oil Company, who contended that pegged prices cost them and nearly 900 other small companies approximately $900,000.

The court refused to issue an injunction against like suits by the other 900 companies. Plaintiffs were given until December 21 to file an amended complaint, to be brought in their behalf only.

Associations

Goforth Renamed Head of Oklahoma Stripper Group

W. A. Goforth, Tulsa, named president of the Oklahoma Stripper Well Association with its organization in 1938, last week was re-elected for the second time when the group held its annual meeting.

Other officers named were Charles Clowe, Ardmore; H. R. Johnson, Tulsa; Dave Morgan, Blackwell, and L. W. Winkler, Duncan, vice presidents; Howard J. Whitehill, Tulsa, secretary-treasurer, and D. G. Powell, Tulsa, executive manager.

Members of the executive committee are: C. C. Harmon, Nowata; Roy M. Johnson, Ardmore; J. B. Steel, Tulsa; Curtis F. Bryan, Tulsa; S. C. Canary, Tulsa; Tide Cox, Ardmore; L. B. Jackson, Sapulpa; Clyde Fowler, Bartlesville; John A. Leavell, Tulsa; R. Gussman, Tulsa; J. Wood Glass, Nowata; John Rebold, Shawnee; Charles Bolpa, Shawnee, and the officers.

Directors for 1941 are Charles F. Ralph, Shawnee; O. V. Beck, Nocona, Texas; J. S. Bridwell, Wichita Falls; J. D. Darby, Tulsa; J. S. Ewing, Healdton; Harold B. Fell, Ardmore; S. C. Granger, Duncan; Earl Q. Gray, Ardmore; R. L. Gordon, Bartlesville; Jake L. Hamon, Dallas; Robert A. Hefner, Jr., Oklahoma City; Charles E. Knox, Enid; R. R. Kirchner, Bristow; Clyde Pape, Tulsa; J. B. Milan, Chelsea; J. D. Roberts, Okmulgee; Will H. Smith, Ardmore; G. W. Strawn, Ardmore; W. J. Siand, Duncan; Frank K. Porter, Oklahoma City; H. F. Worley, Tulsa; George Bradfield, Shawnee; J. R. McGraw, Tulsa; C. E. Burlingham, Bartlesville; Dr. H. C. Wiber, Bartlesville; George L. Pace, Duncan, and W. W. Warner, Nowata.

R. L. Gordon, vice president and general counsel of Indian Territory Illuminating Oil Company, Bartlesville, discussed "Legislation Authorizing Unitization of Royalty Interests for Secondary Recovery Purposes." J. Wood Glass, Nowata, gave a paper on "The Development of Secondary Recovery Methods in Northeastern Oklahoma." G. W. Strawn, Ardmore, spoke on "The Crude Oil Price Dilemma," and Roy M. Johnson, Ardmore, discussed "Items of Interest to Stripper Well Owners."

Scouts Set 1941 Convention At Dallas, March 29-31

The executive board of the National Oil Scouts & Landmen's Association, meeting in Dallas December 7, set the organization's convention for Dallas, May 29-31.

The group reviewed affairs of the association, discussed a membership campaign for 1941, publication of the yearbook and revisions and amendments to the constitution and by-laws.

Those in attendance, shown in an accompanying picture reading clock-wise from the nearest man, were Jim Noel, The Atlantic Refining Company, Houston; H. J. Roberts, Gulf Oil Corporation, Houston; R. W. Pitcher, Tide Water Associated Oil Company, Tyler, Texas; Ed C. Harmon, Seaboard Oil Company, Dallas; Mont. G. Calvert, Humble Oil & Refining Company, San Antonio; M. A. Ricketts, Sinclair Prairie Oil Company, Corpus Christi; W. E. Brown, Shell Oil Company, Houston; E. J. Raisch, association secretary, Austin; C. J. Bradley, The Texas Company, Tyler, association president; H. L. Eversberg, Shell Oil Company, Baton Rouge, Louisiana, first vice president; C. P. Chisholm, The Pure Oil Company, Houston, board chairman; R. H. Weaver, Sun Oil Company, Jackson, Mississippi, second vice president; R. L. Denton, Magnolia Pipe Line Company, Kilgore, secretary - treasurer; Wesley Weed, Sun Oil Company, Alice, Texas; Raymond T. Nelson, Superior Oil Company of California, Corpus Christi; W. L. Allen, Gulf Oil Corporation, Marshall, Texas, and S. C. McKinney, Shell Oil Company, Tyler.

Also in attendance, but not shown in the picture, was H. C. Hoover, Shell Oil Company, Eldorado, Arkansas.

The executive board of the National Oil Scouts and Landmen's Association, pictured during their meeting in Dallas, December 7.

World-Wide Developments

Wasteful Operation Charged In Rumanian Seizure

It has developed that alleged justification of recent seizure of all pipe-line facilities in Rumania by the government was based on the assumption that there was too much duplication in pipe lines, pumping stations, tank farms and other equipment, resulting in extravagant operation. The government contended that small companies were paying too much per ton for transportation of oil in lines owned by the large companies.

British and American interests were major sufferers in the seizure.

Production in Rumania has dropped from 160,000 to 140,000 tons daily, according to Bucharest dispatches, and drilling has fallen off six percent.

The pipe line seizure decree of December 4 read, in part, as follows: "From the date of publication of this law, all petroleum conducts [pipe lines] between the oil fields and storage places, and between storage places and refineries, will become the property of the state. Also pumping stations and parts, reservoirs, installations, buildings and material necessary for the functioning of the above."

A German-Rumanian agreement, promulgated simultaneously with the pipeline seizure decree, provides in Point 4 that "Rumania undertakes to enlarge her transport facilities, including railroads and highways, as well as oil pipe lines."

Notwithstanding justification of seizure of pipe lines on the ground that there was too much duplication of facilities, the government has announced that henceforth the construction and exploitation of new pipe lines can be done only by the state, for which Germany will deliver the necessary equipment at long-term credit.

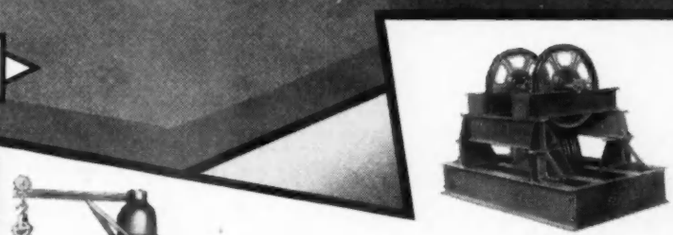
Mexican Ambassador Hints Expropriation Solution

Francisco Castillo Najera, Mexican ambassador to the United States, was quoted last week as stating that a solution was near to the expropriation controversy involving American and British oil properties.

Najera would not amplify his statement, but it is considered possible it may reflect the opening gesture of President Avila Camacho's expected policy of fairness toward business.

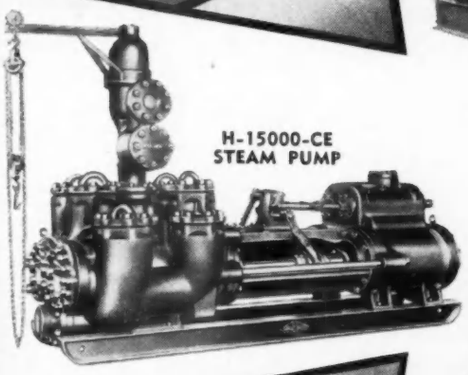
In the meantime, a feeler put out by the new administration in Mexico for resumption of normal diplomatic relations with England has caused embarrassing complications because of the oil problem, the handling of which by the Cardenas regime was unsatisfactory to the British. England desires to resume relations with Mexico, but not if such resumption is predicated in any way upon anything regarding oil.

Explanation is offered that if England compromises its outright denouncement of expropriation of the oil properties by Mexico, then Venezuela and Persia might try what Mexico did. Under existing conditions, England cannot afford any agreement that has the slightest chance of jeopardizing its overseas supply of oil.

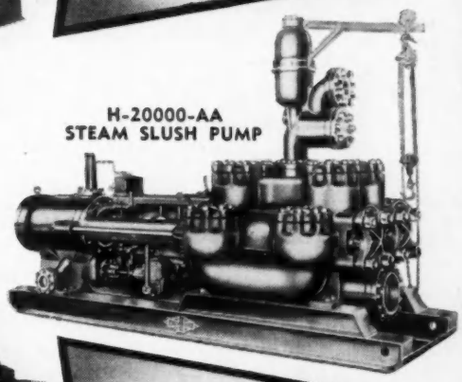


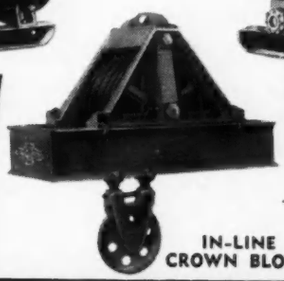
J-7000-B
DOUBLE-DECK
CROWN BLOCK

H-15000-CE
STEAM PUMP



H-20000-AA
STEAM SLUSH PUMP



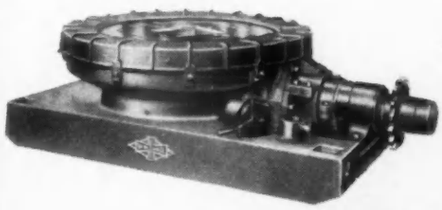


IN-LINE
CROWN BLOCK

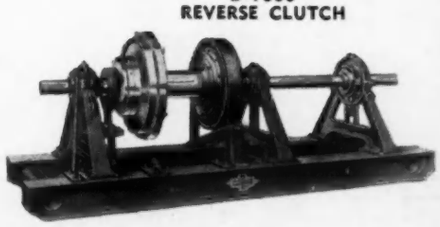
WHELAND

STREAMLINE
TRAVELING BLOCK

A-18000-A
OIL BATH ROTARY



B-7000
REVERSE CLUTCH



OIL BATH
SWIVEL

EXPORT: Lucey Export Corporation,
3505 Woolworth Bldg., New York, N. Y.
Broad Street House, London, E. C. 2,
England

DISTRIBUTORS:

Lucey Products Corporation, Tulsa, Okla.
Houston Oil Field Material Co., Inc., Houston, Texas.
Murray-Brooks Hardware Co., Ltd., Lake Charles, La.
Frick-Reid Supply Corporation, Tulsa, Okla.

THE WHELAND COMPANY

ROTARY DRILLING EQUIPMENT

Chattanooga, Tenn.

Moderate Runs to Stills Aid Statistical Situation

Operations of the industry and resultant changes in stocks continue predominantly favorable. Crude runs to refinery stills were reduced 50,000 barrels to 3,460,000 daily in the week ended December 7, and then were not greatly in excess of the economic level. Crude output at the wells was up sharply, but in compensation for exceptionally strict curtailment the week before.

The reduced refinery runs had not yet been fully reflected in the storage tanks, and there was a 250,000,000-barrel addition to gasoline stocks, whereas only slight accumulations had occurred in the preceding several weeks. For the week ended December 14, however, a favorable reaction of gasoline storage was in prospect.

Both light and heavy fuel oils continued to come out of storage in the week of December 7, with demand sustained at high levels.

United States crude oil production averaged 3,612,600 barrels daily during the week, according to the American Petroleum Institute. That was 277,550 barrels more than average daily output in the previous week, and 52,000 barrels more than market demand, as estimated by the United States Bureau of Mines. In the preceding week, however, underproduction had occurred. The wide fluctuation resulted when Texas fields were shut down only 2 days during the week of December 7, compared with 3 days the week before.

Runs to stills were cut to 3,460,000 barrels daily from 3,510,000 barrels the week before, but were yet possibly 50,000 barrels larger than economically desirable. The new rate was 1.3 percent above the daily average of 3,414,000 barrels maintained in December of last year.

Gasoline Situation

Production of gasoline came down slightly, having totaled 11,489,000 barrels in the December 7 week, compared with 11,503,000 the previous week. In December of last year gasoline production averaged 11,657,000 barrels a week.

Stocks of finished and unfinished gasoline in the United States rose from 80,284,000 to 81,062,000 barrels, an increase of 778,000 barrels, which compared with only negligible additions in the several preceding weeks and normally larger gains in early December in past years. Through subnormal accumulations, the trend of gasoline stocks has been pulled down steadily nearer to the curve for a year ago, and the latest figure of 81,062,000 barrels is within 3,000,000 barrels, or 3.7 percent, of the total of 78,162,000 barrels in storage a year ago. Good demand, as well as fairly strict regulation of refinery runs, apparently has aided in the improvement of the gasoline inventory situation.

Light fuel oils continued to come out of storage in substantial volume, nearly 2,000,000 barrels having been withdrawn in the week ended December 7. After decreasing to 44,305,000 barrels, stocks of gas oil and distillate fuel still were about 7,300,000 barrels, or 20 percent, larger than a year previously, when they totaled 36,946,000 barrels. However, the large withdrawal suggested that the industry should not be too complacent with the inventory of burning oils, and that the yields of the light fuel oils should be maintained at exceptionally high levels to assure adequate supplies. While the present inventory is 20 percent larger than that held a year ago, total demand for heating oil has been running nearly 10 percent above the year-ago trend, despite the sharp curtailment of exports. It remains to be seen how severe the weather will be this winter, but the industry's only safe course is to recognize the possibility of extreme weather that would cause heavy demand for heating oil.

Demand for heavy fuel oil continues large, in line with the record-breaking activity of the nation's industrial and commercial establishments, and 1,265,000 barrels of residual fuel oil came out of storage in the week ended December 7. Having declined to 105,353,000 barrels, the stocks were 3.6 percent smaller than a year previously, when they totaled 109,290,000 barrels.

Crude oil stocks in the United States increased about a million barrels in the week ended November 7, the bureau reported. They rose from 261,723,000 to 262,679,000 barrels, and then were 12 percent larger than a year before, when the total of 234,161,000 barrels was not far above the 17-year low level reached in the autumn of 1939 following the half-month shutdowns of Mid-Continent oil fields.

Trends of Operations and Changes in Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports

WEEK ENDED	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	FUEL OIL STOCKS	
					Gas Oil & Dist. Fuels	Residual Fuel Oil
1938:						
November 12	3,243,250	3,180,000	273,394,000	[6]67,551,000	34,175,000	120,491,000
December 10	3,245,100	3,150,000	[6]269,509,000	68,687,000	32,068,000	118,711,000
1939:						
April 22	3,526,700	3,280,000	277,156,000	[2]87,769,000	21,085,000	105,035,000
April 29	3,568,200	3,405,000	278,440,000	86,794,000	[7]25,844,000	[7]108,409,000
May 6	3,580,900	3,275,000	[2]278,607,000	86,216,000	26,167,000	108,597,000
July 29	3,539,100	3,460,000	268,513,000	77,887,000	34,900,000	114,053,000
August 5	[1]3,909,400	3,445,000	268,982,000	76,431,000	35,601,000	114,512,000
August 26	[5]1,690,800	3,475,000	246,982,000	73,475,000	37,722,000	116,237,000
September 30	3,658,200	3,560,000	233,023,000	71,168,000	38,081,000	115,466,000
October 7	3,435,850	3,505,000	231,564,000	[6]71,152,000	38,549,000	114,397,000
October 21	3,771,550	[2]3,650,000	[2]229,127,000	72,122,000	39,358,000	115,060,000
October 28	3,498,500	3,520,000	230,453,000	72,660,000	39,562,000	114,786,000
November 25	3,818,100	3,510,000	231,811,000	75,595,000	38,527,000	112,106,000
December 30	3,545,000	3,445,000	237,742,000	80,985,000	34,184,000	106,680,000
1940:						
January 27	3,611,600	3,470,000	237,339,000	87,914,000	27,407,000	103,015,000
February 24	3,732,100	3,490,000	240,836,000	96,719,000	25,390,000	103,419,000
March 30	3,841,250	3,585,000	250,561,000	101,370,000	23,778,000	105,081,000
April 20	3,858,550	3,535,000	254,881,000	[1]102,817,000	24,779,000	103,323,000
April 27	3,845,250	3,555,000	256,670,000	102,452,000	24,997,000	102,552,000
May 25	3,835,650	3,580,000	259,330,000	100,297,000	28,356,000	104,015,000
June 22	3,846,450	[1]3,690,000	260,891,000	97,276,000	32,751,000	104,683,000
June 29	3,639,550	3,625,000	262,059,000	95,142,000	33,590,000	104,486,000
July 27	3,690,400	3,555,000	262,579,000	90,173,000	38,981,000	105,924,000
August 31	3,501,350	3,575,000	265,865,000	85,393,000	44,766,000	108,774,000
September 28	3,799,950	3,600,000	263,609,000	82,373,000	47,986,000	108,450,000
October 26	3,640,300	3,565,000	262,746,000	80,891,000	[1]48,893,000	108,475,000
November 2	3,479,950	3,535,000	263,820,000	80,774,000	48,615,000	108,199,000
November 9	3,584,200	3,510,000	261,631,000	79,847,000	48,408,000	107,687,000
November 16	3,576,550	3,540,000	261,619,000	80,063,000	48,108,000	107,151,000
November 23	3,765,900	3,510,000	261,723,000	80,100,000	47,511,000	106,871,000
November 30	3,335,050	3,510,000	262,679,000	80,284,000	46,212,000	106,618,000
December 7, 1940	3,612,600	3,460,000	.....	81,062,000	44,305,000	105,353,000
December 7, 1939	3,827,350	[3]3,414,000	[4]234,161,000	78,162,000	36,946,000	109,290,000
Change in past year.	—5.6%	+1.3%	+12.2%	+3.7%	+19.9%	—3.6%

[1] All time peak. [2] Peak for year. [3] Lowest since April, 1922. [4] Stocks, December 2, 1939.
[5] Lowest since October, 1922, due to shut down of six Mid-Continent states. [6] Lowest for year.
[7] Prior to April 29, 1939, data did not include stocks at terminals, in transit, etc., except in California.
[8] December, 1939, daily average.

Markets Generally Firm; Fuel Oil Demand Brisk

The industry's markets continue generally firm, with demand for both light and heavy fuel oils particularly brisk. Kerosene also is moving in good volume, and lubricants are steady. Gasoline consumption remains relatively large, and prices have been maintained in some areas at somewhat improved levels, although recent efforts to advance tank wagon and service station prices in Texas and Oklahoma failed, when increases were rescinded last week.

Continued moderate refinery runs have helped the gasoline market, additions to storage having been held to subnormal proportions.

However, withdrawals of fuel oils from storage have been accelerated, and the possibility has arisen that refiners may consider it expedient to step up plant throughput in order to increase output of those oils. In such event, production of gasoline necessarily would increase, also, and stocks of that product would be in danger of expanding undesirably.

Clearly, there is need for holding down yields of gasoline and for taking maximum practicable yields of both light and heavy fuel oils.

Heretofore, principal concern has been over adequate winter supplies of heating oils. But recent market developments have indicated that serious attention should be given also to heavy fuel oils, for which demand has been remarkably brisk. In the Mid-Continent last week there were reports of urgent demand for heavy fuel oils by the railroads. And consumption of the heavy oils naturally is large in the industrial sections of the Middle West and the East, because of the exceptionally active operations at factories and mills.

The threatened general reduction of crude prices in the Mid-Continent had not materialized late last week, and it appeared doubtful if any general revision would occur before the end of the year, if at all. At the emergency hearing of the Texas Railroad Commission at the middle of the week, called for rechecking purchasers' nominations, there was no evidence that buyers were obtaining more crude than they wanted, in most instances. Only a few of the smaller purchasing companies indicated the need for reductions of the volumes of their takings. On the other hand, some purchasers stated that they could use more crude than they were able to buy, under the existing allowables. For example, one major company indicated that it needed more West Texas crude.

Nevertheless, pressure on the Mid-Continent crude prices remains, as the situation of non-integrated refiners of the Southwest remains unsatisfactory. Prices of gasoline, near all-time lows, still do not justify payment of the established postings for crude. Some refiners have met the situation by cutting down their plant operations, and several on the Gulf Coast have cut their posted prices for crude, as reported a week ago. Their problem has been aggravated, moreover, by the shooting of coastwise tanker rates up to unprecedented heights.

The last paid rates were reported at the middle of the past week at 80 cents

Wholesale Prices of Refined Products

REFINED GASOLINE	Range late Last week (Cents a gal.)		Changes from week Before	
Oklahoma Refineries:				
60 Octane and under	3¾	4¼	...	...
63-66 Octane	4⅛	4½	...	...
72-74 Octane	4½	5	...	...
Mid-Western Tank Car:				
60 Octane and under	3¾	4¼	...	...
63-66 Octane	4⅛	4½	...	...
72-74 Octane	4½	5	...	...
New York Harbor:				
68-70 Octane	5½	5½	+¼	...
72-74 Octane	5½	6⅛	+¼	—⅜
Gulf Coast:				
60 Octane unleaded	3¼	4½	...	...
65 Octane unleaded	3½	4⅝	...	...
72-74 Octane leaded	3½	4¾	...	...
NATURAL GASOLINE				
Grade 26-70:				
F.O.B. Group 3	2¼	2¼	...	...
F.O.B. Breckenridge, Tex. 2		2	...	...
KEROSENE				
Oklahoma Refineries:				
41-43 water white	3⅞	4	...	...
42-44 water white	4	4⅛	...	...
Mid-Western Tank Car:				
41-43 water white	3⅞	4	...	...
42-44 water white	4	4⅛	...	...
New York Harbor	5⅜	5½	...	...
RANGE OIL				
At Oklahoma Refineries	3¾	3¾	...	...
In Mid-Western Market, Group 3, basis	3¾	3¾	...	...
LIGHT FUEL OILS				
Oklahoma Refineries:				
No. 1 straw	3½	3⅝	...	...
No. 3	3⅜	3½	...	...
Mid-Western Tank Car:				
No. 1 white	3½	3⅞	...	+⅛
No. 3	3¼	3½	...	...
New York Harbor:				
No. 1	5⅜	5½	...	...
No. 3	4¾	4¾	...	...

HEAVY FUEL OILS	Range late Last week (Per Bbl.)		Changes from week Before	
Oklahoma Refineries:				
No. 6	$0.60	$0.60	+.05	...
Mid-Western Tank Car:				
No. 5	.75	.85	...	+.10
No. 6	.55	.60	+.05	...
New York Harbor:				
No. 5	1.45	1.55	...	...
No. 6	1.15	1.25	...	...
BUNKER C FUEL OIL (Per barrel, ships bunkers)				
Gulf Coast	$ .80	$ .90	...	...
New York Harbor	1.15	1.25	...	...
DIESEL OIL (Per barrel, ships bunkers)				
Gulf Coast	$1.50	$1.70	...	...
New York Harbor	1.95	1.95	...	...
Los Angeles Basin, 27 gravity	1.15	1.35	...	...
LUBRICATING OIL (Cents a gal.)				
Oklahoma Refineries:				
Bright Stock, 150-160 viscosity at 210°, 10-25 pour test	12½	15	—½	—½
Neutral oil, pale No. 3 color, 150 viscosity at 100°, 0-10 pour test	8	10¼	...	...
Western Pennsylvania:				
Bright Stock, 145-155 viscosity at 210°, 25 pour test	12	14	...	...
Neutral Oil No. 3 color, 150 viscosity at 70°, 25 pour test	19	20	...	+1

United States Crude Oil Production Cut Close to Demand

Estimates Compiled by The OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (Dec.)	State Allowable (Barrels Daily in Dec.)	BARRELS DAILY FOR WEEK ENDED Dec. 7	Dec. 14
TEXAS—				
Texas Panhandle	.....	.....	81,300	77,100
North Texas	.....	.....	113,800	107,200
West Central Texas	.....	.....	31,200	30,800
West Texas	.....	.....	217,300	217,900
East Central Texas	.....	.....	80,900	80,800
East Texas Field	.....	.....	375,400	374,700
South Texas	.....	.....	202,600	198,600
Texas Gulf Coast	.....	.....	243,700	242,700
Total Texas	1,277,000	1,316,657*	1,346,200	1,329,800
CALIFORNIA—				
Long Beach	.....	.....	41,500	41,400
Midway-Sunset	.....	.....	43,500	43,800
Kettleman Hills	.....	.....	39,100	38,900
Wilmington	.....	.....	82,000	83,000
Others	.....	.....	394,000	409,500
Total California	593,900	571,000†	600,400	616,600
OKLAHOMA—				
Oklahoma City	.....	.....	108,100	80,100
Seminole Area	.....	.....	101,950	100,225
Others	.....	.....	209,675	204,125
Total Oklahoma	422,600	390,000	419,725	384,450
ILLINOIS—				
Salem	.....	.....	117,800	117,700
Louden	.....	.....	69,000	67,500
Centralia	.....	.....	16,300	16,500
Other New Pools	.....	.....	109,800	116,800
Old Pools	.....	.....	10,600	10,300
Total Illinois	363,600	.....	323,500	328,800

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (Dec.)	State Allowable (Barrels Daily in Dec.)	BARRELS DAILY FOR WEEK ENDED Dec. 7	Dec. 14
LOUISIANA—				
North Louisiana	.....	.....	66,600	68,400
South Louisiana	.....	.....	220,200	218,500
Total Louisiana	280,300	287,246	286,800	286,900
KANSAS	188,400	192,400	183,100	199,050
NEW MEXICO	100,600	104,000	101,300	101,200
EASTERN STATES—				
Pennsylvania Grade	47,900	.....	69,100	66,800
Others, Eastern	43,000	.....	20,500	20,100
Total Eastern States	90,900	.....	89,600	86,900
MOUNTAIN STATES—				
Wyoming	74,500	.....	73,100	71,800
Montana	19,700	.....	17,800	18,100
Colorado	3,900	.....	3,400	3,500
Total Mountain States	98,100	.....	94,300	93,400
MICHIGAN	47,100	44,000‡	46,500	45,400
ARKANSAS	66,100	70,176	69,500	69,100
INDIANA	15,500	.....	20,600	21,100
MISSISSIPPI	13,900	.....	17,000	13,500
NEBRASKA	2,000	.....	2,650	2,450
§Total 8 Prorated States	2,976,000	2,975,479	3,053,525	3,032,500
Total United States	3,560,000	.....	3,601,175	3,578,650

*** Estimated net basic daily allowables as of December 1. Railroad Commission estimates that actual production normally is about 3 percent under the new allowable. But allowable normally increases as new wells are completed. Under December order, most Texas fields were ordered shut down December 1, 7, 8, 14, 15, 22, 25, 31.**

† Recommendation of Conservation Committee of California Oil Producers.

‡ Estimate of actual production under prescribed regulations, which do not fix a definite state total allowable.

§ Texas, California, Oklahoma, Louisiana, Kansas, New Mexico, Arkansas, Michigan.

for moving No. 2 fuel oil from the Gulf Coast to the Atlantic seaboard, 75 cents for kerosene, 70 cents for gasoline, and 60 cents for heavy crude and fuel oil of 10-20 gravity.

The sharp rise in tanker rates has led to resumption of pipe line movement of crude from the Mid-Continent to the East Coast. Gulf Oil Corporation will move Oklahoma crude by pipe line to its refinery outside Philadelphia, having filed with the Interstate Commerce Commission a common carrier rate of 57 cents a barrel for moving crude from Cushing, Oklahoma, to Philadelphia, effective December 12. Crude for the Philadelphia plant has been supplied heretofore by tankers from the Gulf Coast.

Crude Oil Production Comes Down Moderately

United States crude oil production was reduced moderately and closely approached the indicated economic level in the week ended December 14, having averaged 3,578,650 barrels daily.

That was 22,525 barrels a day less than output in the previous week but 18,650 barrels more than average daily market demand in December, as forecast by the Bureau of Mines.

California, Kansas, and Illinois produced at higher rates than in the previous week, but the gains in those states were more than canceled by decreases in Oklahoma and Texas.

Oklahoma output dropped to 384,450 barrels daily from 419,725 the week before and was under both the state allowable and the Bureau of Mines estimate of demand. Texas declined to 1,329,800 barrels daily from 1,346,200 the previous week but exceeded demand over 50,000 barrels and the state allowable about 13,000 barrels.

California production rose 16,200 barrels to 616,600 daily, and exceeded demand over 20,000 barrels, while the strict state allowable was exceeded 45,000 barrels. Kansas rose 16,000 barrels to 199,050 daily and thereby exceeded the state allowable about 7000 barrels and market demand 11,000. Illinois had a reversal of trend, as output rose to 328,800 barrels daily from 323,500 the week before. But Illinois production still was 35,000 barrels short of estimated market demand.

Louisiana, New Mexico, Michigan, and Arkansas showed only nominal changes from the production rates of the previous week.

Albanian Oil in Path Of Current Greek Drive

Annual production of about 125,000 tons of low-grade oil coming from some 400 wells in Albania's Kucova field, near Berat, lies in the path of the Greek army's drive toward the coast. Nearby Devol is connected to the seaport of Valona by a 46-mile pipe line which has been supplying oil to Italian forces.

Walker Field Hearing

Operating rules for the new Walker field, Coleman County, have been scheduled for hearing by the Texas Railroad Commission December 18. At the same time, the commission will take up the request for an increase in the allowable for the J. C. Ort's Walker 1.

October Production Up Slightly From September

Domestic crude oil production averaged 3,658,600 barrels a day in October, 14,000 barrels above the September figure but 25,200 barrels under the average for October, 1939, it was reported December 11 by the United States Bureau of Mines.

The gain in output, however, was accentuated by a reduction in crude runs to stills, with the result that the addition of some 700,000 barrels to stocks of refinable crude during the month went far to offset the reduction of 1,100,000 barrels made in September, the bureau said.

Total production for the month was 113,418,000 barrels, 4,000,000 barrels above the September figure of 109,337,000 barrels, but some 600,000 under the October, 1939, output of 114,010,000 barrels.

The bureau reported that in October, as in the preceding month, Texas was largely responsible for the national gain, daily average output for the state rising about 55 000 barrels to 1,373,900 barrels. Every major district in Texas showed an increase, although that part of the Rodessa field which is in that state declined, but, the bureau pointed out, that area is no longer of major importance. Oklahoma and New Mexico registered small gains, but California, Illinois, Kansas and Louisiana dropped off, the decline in Illinois bringing production down to below 350,000 barrels, or approximately the production level of December, 1939. In the final month of last year, it was commented, 261 wells were completed in the state for a total initial of 108,200 barrels, but in October of this year 268 new wells added only 50,000 barrels total initial.

Gasoline Yields Down

Yields of gasoline and distillates reflected their respective stock positions, and both declined in October, the report showed. The gasoline yield fell from 43.9 percent in September to 43.5 percent the following month, and the distillate yield dropped from 13.7 to 13.1 percent. On the other hand, the residual yield increased 1.8 percent, to 25.5 percent for October, or more than the aggregate decline for the other two products.

Domestic demand for motor fuel for the month was 53,807,000 barrels, or eight percent higher than a year ago. Exports continued to exceed expectations, but the total of 2,149,000 barrels was nearly 40 percent lower than last year.

However, the bureau commented, "the favorable demand and the curtailment in crude runs were reflected in gasoline stocks and, for what is probably the first time in history, the reduction in gasoline inventories in October (2,722,000 barrels) exceeded that of the previous September."

Output of aviation gasoline fell from the September total of 1,107,000 to 1,031,000 barrels in October. Exports declined from 301,000 to 291,000 barrels, the latter including 132,000 barrels of anti-knock compounds, while domestic demand increased from 463,000 to 553,000 barrels. There was a slight addition to stocks, which increased from 5,955,000 to 6,142,000 barrels, where they compared with 2,400,000 barrels at the close of October, 1939.

The domestic demand for gas oil and distillates was found by the bureau to have been "very strong," the total of 13,574,000 barrels being 24 percent above October, 1939. Residual fuel oil demand increased six percent.

Bureau of Labor Statistics figures placed the price index of petroleum products in October at 49, compared with 48.9 in September and 54 in October a year ago. The crude-oil capacity represented in the report was 4,306,000 barrels, giving an operating ratio of 82 percent, compared with 83 percent in September and 86 percent in October, 1939.

Natural Gasoline Output Gained in October

Natural gasoline production in October advanced to a daily average of 6,838,000 gallons from 6,588,000 gallons in September, it was reported December 13 by the United States Bureau of Mines.

The outstanding increases occurred in the Appalachian, Texas Gulf, Kettleman Hills and Oklahoma City districts.

There was a further decline in stocks, those at plants and terminals dropping from 151,116,000 to 138,810,000 gallons and at refineries from 144,480,000 to 137,088,000 gallons, the bureau stated. Total stocks, however, were approximately 60,000,000 gallons more than on October 31, 1939.

Robinson Heads Petroleum Electric Power Association

E. L. Robinson of Gulf States Utilities Company, Beaumont, Texas, was elected president of the Petroleum Electric Power Association at the association's annual meeting at Baton Rouge, Louisiana, Thursday and Friday of last week. Other officers elected include H. E. Roberts, Empire District Electric Company, Joplin, Missouri, vice president, and K. K. Kreamer, Houston Lighting & Power Company, Houston, secretary.

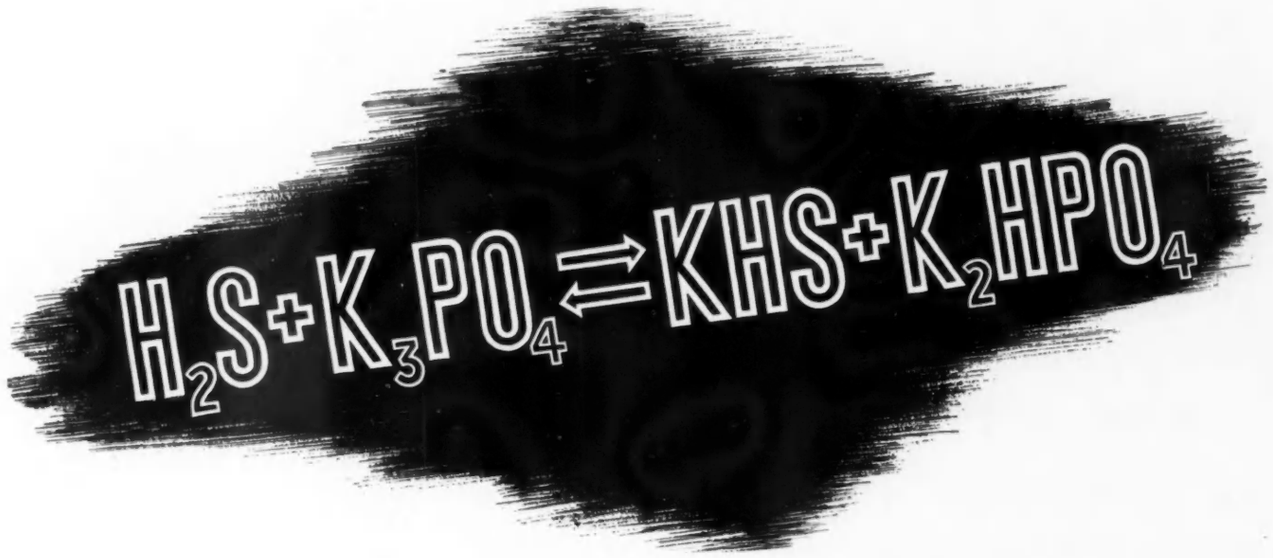
Louis Blalock of Texas Power & Light Company presented a paper by Walter Moore on "Methods of Meeting Engine Competition." He was followed by W. H. Steuve of Oklahoma Gas & Electric Company who gave a discussion on "High-Speed Gas Engines."

H. E. Draille, of the industry engineering department of Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pennsylvania, brought a message from the electrical manufacturers, discussing new developments and equipment.

A. M. Young, of the Central Illinois Public Service Company discussed "Illinois Field Methods" as the closing address of the meeting.

Thursday night, 100 delegates to the convention were entertained with a banquet by Gulf States Utilities Company. A. B. Paterson, president of New Orleans Public Service Company was guest speaker at the banquet, and spoke on national defense and the power industry.

E. H. Armstrong, ot the Public Service Commission of North Illinois, Chicago, was toastmaster at the banquet. He is the retiring president of the association.



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Not one bolt has been tightened since the tree was installed.

McEvoy Well Heads and Christmas Trees were selected for every well in this field.

Dewey Butts, Superintendent for H. M. Harrell, shown standing beside one of the 25,000,000 cubic foot per day input wells at the Bammel Recycling Plant.
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DATA

Input gas pressure...2700 lbs. per sq. in.
Temperature of gas...215 degrees F.
Cubic feet of gas returned to formation through this well, per day...Approx. 25,000,000 cu. ft.

Records such as this are common to users of McEvoy Completion equipment. The extra quality built into this equipment assures extra economy and freedom from trouble.

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Steel of 100,000 pounds tensile strength is used for high pressure McEvoy Well Heads. Every heat of steel is checked for analysis, strength and hardness before being made into heads. Extra strength gives you greatest protection from costly failures.

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Long life packings, reduced number of joints, simplified hangers — these McEvoy features result in less trouble and lower costs for you.

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This figure was calculated from the average well flow of 25,000,000 cubic feet per day from July 3, 1939 to December 1, 1940

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Michigan

To Proceed With Drilling Basin Trenton-Lime Test

Gulf Refining Company will proceed with original plans to test the Trenton lime and St. Peters (Wilcox) sand on the Bateson 1, Section 2-14n-4e, Bay County, which caught fire December 5 at 7776 feet. However, deepening still is predicated on recovery of drill pipe and a satisfactory casing-head hookup.

Deepest test ever drilled in Michigan and first to drill below the Sylvania sandstone in the central basin area, it was shut in on a master gate of 6000-pound test after backing off from the full rotary drill pipe string on November 29 to wait arrival of blowout preventers. From 7358 to present depth, hole had given trouble from gas encountered at several different levels in the Salina salt horizon. Mud weight had been increased from 11.2 to as high as 14.4 pounds without holding back the gas pay breaks. At 7452 feet, it showed 12,000,000 feet gas and 3175 pounds rock pressure on drill-stem test. Hole had blown out drilling mud twice at this point during attempts to pull out.

At 7776 feet, it got away and cleaned hole of drilling mud. At this point, drill pipe was backed off and well closed in at master gate. A new gas pay appeared to have been drilled at 7776 feet, and although it was not gauged, officials estimated flow from 20,000,000 to 25,000,000 feet. It showed 3200 pounds on closed-in casing-head pressure test.

Six hours before work was scheduled to begin on installing blowout preventers, and six days after the last blowout, the nipple and short joint between the bradenhead on the 9-inch (3625 feet) and the 13-inch (666 feet) and the mastergate above gave away, and the well fired immediately.

Gulf officials announced that a new 136-foot derrick and new rotary rig had been ordered and would be assembled immediately. It probably will be two weeks before the new rig will reach the location.

Because of the high pressure and the bottom-hole pay, Gulf Refining Company engineers expressed confidence that the hole kept clean and that drill pipe can be recovered. Whether the hole can be carried to its original objective, 9000 to 10,000 feet, however, is now largely predicated on the recovery of the drill pipe. The company already has invested around $150,000 in the test, exclusive of the fire loss estimated between $100,000 and $135,000.

Bateson 1 logged the Salina at 5480 feet, and last samples, recovered at 7771 feet, showed formation unchanged, although bottom hole is now believed close to the top of the Niagaran limestone. To reach the Trenton lime, a minimum of 8400 feet is chartered, with the St. Peters sand expected below 9300 feet. The test is not only the deepest ever drilled in the state but the first to drill the Salina in the central basin.

No particular commercial significance was attached to the first gas shows encountered in the Salina salt section. However, after the well blew wild for about 90 hours from 9-inch casing, gas engineers were inclined to credit the pay with commercial prospects.

Out of 20 completions reported, only four made oil wells for a gross initial of 380 barrels and the poorest showing in Michigan this year. It emphasized the failure of any of the 35 discoveries, plus 688 dry wildcats drilled since January 1, 1939, to deliver an important pool.

Walter L. McClanahan may have a pool opener or extension forerunner on the Campagner 1, SW SE SE 11-4n-14w, two miles northwest of Traverse-lime production in Overisel Township, Allegan County. The test topped Traverse at 1547 feet and carried 450 feet of oil at 1547½ feet. Drilling was halted to set casing at 1515 feet where hole had been reduced.

Welsh Oil Company was unable to get commercial results after two attempted acid treatments on the Cussen 1, SW SW NW 5-21n-16w, Blue Lake Township, Muskegon County, a wildcat. Test had Traverse at 1829 feet, and bottomed at 1840 feet after showing oil saturation.

Daily Crude Oil Company started to deepen to the Dundee-Monroe lime objective, around 3200 feet, after testing a Traverse-lime pay at 2980 feet in Weatherby 3, SW SE SE 20-12n-9w, Montcalm County.

William P. Shoemaker's Rogers 1, NE SE 34-23n-16w, Manistee County wildcat, was shut down for orders at 2019 feet, but may be carried deeper for a Sylvania test. Test did not show in the Dundee lime, logged at 1580 feet.

Weber Oil Company set 6-inch casing on the Fatum 1, Section 30-18n-10w, Osceola County, at 1570 feet. Fatum 1, is ¼-mile north of same company's Gabel 1, completed last month for a 30-barrel wildcat discovery pumper in the Monroe at 3635 feet.

Gulf Refining Company's Bateson 1, deep test in Bay County, Michigan, the day following a blowout from 7775 feet. A new derrick and rig has been ordered to continue drilling to the St. Peters (Wilcox) objective expected at 9000-10,000 ft.

Oklahoma

Minor Extensions for Dill; Small Strike in Okfuskee

John Droppleman and Konawa Operating Company extended Dill pool, Okfuskee County, one location west in the north extension area at Dill "C" 5, NW NE SE 34-12n-8e. Bottomed at 3580 feet in Cromwell sand, it gauged 1746 barrels in 24 hours through 7-inch casing. Shell Oil Company extended production for the same pool one location northeast at Curry 4, NE SW NW 35-12n-8e, which flowed 535 barrels in 24 hours through 4-inch casing. Hole was being cleaned after shooting with 25 quarts at 3576-3601 feet. John Droppleman et al started work at Dill "C" 6, a north offset to "C" 5, with location in SE SE NE 34-12n-8e. Phillips Petroleum Company spudded Joney 1, SE NE NE 34-12n-8e, ¼ mile northwest of production on Shell Oil Company's Curry lease.

In Okfuskee County, Viersen Oil & Gas Company and Fred Phillips completed Leonard 1, SE SE NW 11-13n-7e, 3 miles west of Micawber pool and south of West Arno pool. Prue sand, topped at 2614 feet, was based at 2645 feet, Dutcher was logged at 3548 feet, and Mississippi Caney at 3588 feet. Hole was plugged back from 3594 to 2619 feet, and Prue sand shot with 60 quarts at 2606-19 feet. Flow gauged 7 barrels of oil and 30 barrels of water in 24 hours.

Two miles north of Okemah, Davon Oil Company abandoned Sporleder 1, C SW NW 35-12n-9e, at 3978 feet in dry Hunton lime, topped at 3918 feet. Perforations in Upper Hunton brought in water when hole was plugged with cement at 3960 feet. Although this failure is an important marker in Okfuskee County development, wildcatting continued unabated in the area. Portable Drilling Company's Nelson 1-A, NE SE SW 1-11n-9e, southeast of the above dry hole, was dry in Hunton lime at 3846-3939 feet and in Wilcox sand at 4075-4108 feet. Seven-inch casing was pulled up to base of Cromwell sand, topped at 3336 feet, and cement plug set. Operators were drilling out cement in this formation for a test. An electric log indicated possibilities for this horizon.

Gulf Oil Corporation and The Carter Oil Company abandoned their deep Pennsylvanian sand test in Stephens County. Qualls 1, C SW NE 23-1n-7w, northeast of Duncan, and the second test drilled below the 10,000-foot level this year in Oklahoma, reached 10,157 feet. Casing perforations at 6885-92 feet were ineffective. With plug set at 6100 feet, lower perforations at 6022-34 and 6034-44 feet were uncommercial.

Gulf Oil Corporation's Grace Hess 1, C NE NW 33-23n-13w, in the Woods, Major and Alfalfa tri-county area, topped Chester lime at 6570 feet, upper Mississippian, and was making slow drilling progress below 7395 feet in the Mississippi lime. Traces of asphalt showed at 6991-97 feet, and asphaltic stains were logged in holes to 7090 feet. The same operator's Krieger 1, C E½ NE SW 3-2n-5w, extreme south end of Knox pool, northern Stephens County, has large derrick erected for a deep test.

Ray Stephens, nc. et al's Lankford 1, SEc NW 6-6n-9w, 3 miles southeast of Anadarko and 4 miles north of Cement pool, Caddo County, was rotating below 4500 feet, and withholding geologic information.

Prospects were high for a shallow-sand pool for Jefferson County at Johnson Drilling Company et al's Bound 1, NW NW SW SW 13-6s-6w, 1½ miles north of Spring pool. Sand with good shows of oil were cored at 1842-50 and 1850-55 feet. Additional cores will be recovered prior to testing. Danciger Oil & Refineries' Hefner 1, SEc 3-4s-4w, 2 miles west of Healdton pool, across the line in Jefferson County, was shut down for orders at 1943 feet in dry sand. Operators may deepen.

Two important wildcats are nearing Wilcox sand in Payne County. J. E. Crosbie, Inc. et al's Moore 1, NEc NW 29-19n-2e, near West Stillwater pool, logged Oswego lime at 4010-60 feet for a show of oil at 4050-60 feet. Mississippi lime was encountered at 4418 feet, with good gas odor showing at 4440-50 feet. At 4550 feet, bit was rotating in lime. Roy Starr Oil & Gas Company's State 1, C W½ SW SW 16-20n-2e, 7 miles north of West Stillwater pool, topped Mississippi lime at 4614 feet and was checking higher than a dry hole in NE 16-20n-2e. Incorrect pipe measurements have changed tops on all geologic markers.

Alma Oil Company's Hill "A" 1, C N½ NW SW 1-21n-5e, 5 miles east of Pawnee and in that county, topped Mississippi lime at 3145 feet, Wilcox sand at 3363 feet, and stopped at 3369 feet. After electric log, pipe will be run and test made in Wilcox sand.

Big Chief Drilling Company and Kenneth Ellison et al's Strange 1, C SW SE 27-18n-4w, east flank of Lovell pool, Logan County, perforated pipe in Avant, topped at 4266 feet, for a hole full of water. It is shut down for orders. Layton sand was absent and hole was carried to 5127 feet without a show.

Kansas

Commercial Oil in Permian Indicated in Thomas County

In northwest Kansas, Alva Billings et al had initial commercial production in Thomas County at Ryan 1-A, C E½ NE SE 27-8-32w, between Halford and Mingo and 10 miles southeast of Colby. Not only has production been extended to the farthest point in Kansas to date, but a new horizon has been opened. Heading only 5 barrels of crude at intervals, operators will run tubing and acidize. Production is from the Permian series at 3635-38 feet. This formation fails to correlate with other producing zones. Dakota formation was logged at 1595 feet, and no other tops were available. Eight-inch casing was cemented at 3620 feet before drilling plugs.

Six miles west of Hill City in Graham County, R. W. Shields et al's Paxson 1, NEc 11-8-24w, wildcat strike in a lime horizon of the Lansing-Kansas City zone, pumped and flowed 45 barrels in 4 hours but did not pump off. After shut in 9 hours, it gauged 48 barrels in 4 hours. Crude tested 43-gravity, highest yet discovered on the western flank of the Barton Arch.

Viola-lime production was extended a mile south in Cunningham pool, Pratt County, at Springrose Drilling Company et al's Kemp 1, CSL NE NW 12-18-11w, in a bottle-neck structure between oil and gas production in Cunningham pool and 5 miles east of Cairo pool. Establishing a potential of 2940 barrels daily, it is the second largest Viola-lime producer for that area. Pay was penetrated to 4260 feet and treated with acid before completion.

McPherson Drilling Company et al's Grizzell 1, SW SE NE 8-19-9w, wildcat between Haferman and Chase pools, Rice County, opened a new Arbuckle-lime pool. Pay was topped at 3444 feet, and 7-inch casing cemented at 3446 feet. When plugs were penetrated to 3448 feet, crude filled the entire oil string, and in 40 minutes began flowing. Skelly Oil Company and Bay Petroleum Corporation supported this wildcat.

Greenvale Northwest has been designated as pool name for Magnolia Petroleum Company's Borrell 1, C S½ SE NE 32-14-12w, Russell County, by the Kansas Nomenclature Committee. Potential was set at 319 barrels per day in Lansing-Kansas City lime at 2889 feet. Stanolind Oil and Gas Company's Driscoll 1, C S½ SE NE 30-15-11w, initial Arbuckle lime discovery in the one well Gorham-sand area labeled as Driscoll pool, Russell County, made a temporary potential of 281 barrels per day. Lime at 3260 feet was acidized. This strike is ½ mile east of the discovery.

Jones Brothers defined Mahoney pool, Russell County, at Mahoney 3, C S½ NW SW 8-14-12w, dry in Lansing-Kansas City lime at 3017 feet. The pool has two producers from this horizon.

Shawnee lime is a new producing zone in North Prusa pool, Barton County. Armer and Vernon Oil & Gas Company's Ney 1, CSL SW NE 17-16-11w, made a temporary potential of 68 barrels daily.

Continental Oil Company had a wildcat failure at Karst 1, NW NE NW 12-16-15w, 3 miles south of Boxberger pool, northern Barton County. Arbuckle lime was dry at 3413-23 feet. C. N. Bolin et al's Parsley 1, NWc NE 23-25-4e, between El Dorado and Pierce pools, Butler County, was plugged in Bartlesville sand at 1424-44 feet, after filling with water.

Atlantic Refining Company and Helmerich & Payne, Inc., were drilling below 3000 feet at Baumgarten 1, C E½ SE NW 25-9-19w, 6 miles north of Zurich pool, Rooks County. Cities Service Oil Company's Steinle 1, NE SW NW 36-14-12w, 3½ miles east of northwest Greenvale pool, Russell County, was drilling with rotary tools below 2500 feet.

Forest City Basin

Falls City's Twenty-Sixth Well Starts at 600 Barrels

Skelly Oil Company completed the twenty-sixth producer in Falls City pool at Wallraff 3, C SE NW SE 20-1n-16e, which flowed 600 barrels in 24 hours through 7-inch casing cemented at 2230 feet. Hunton lime topped at 2229 feet, was penetrated to 2253 feet. After two acid treatments totaling 1000 gallons, flow started at 25 barrels hourly. Surface pipe was cemented in Wallraff 4, NE SW NE SW 20-1n-16e, and surface pipe cemented.

Twelve miles southeast of Auburn, Nemaha County, Francis Krone and Skelly Oil Company was drilling Morehead 1, C SE NE 35-4n-16e. Below 2350 feet, nearing Hunton-lime zone.

Wildcatting spread north with L. H. Hough et al spudding Timm 1, C S½ SW SE 15-13n-12e, 13 miles northwest of Plattsmouth, Sarpy County, Nebraska. Two wildcats were started in Richardson County, Johnson & Mitchell have rotary rig at Burgner 1, NE SE NE 31-1n-16e, 1¾ miles south of Falls City pool. Midland Development Company spudded Fehr 1, C NW SE 31-2n-16e, 2½ miles north of Falls City pool.

Between Ogle and Falls City areas, Forest City Basin Syndicate et al abandoned Windle-Dodge 1, SE NE SE 3-1n-15e, Richardson County, at 2605 feet in Hunton lime. Topped at 2565 feet, lime had water at 2602-25 feet.

Ten miles southwest of Plattsmouth, Cass County, Nebraska, Golden Rod Oil Company's Sporrer 1, SEc 8-11n-13e, topped Viola lime at 1020 feet and cemented 5-inch casing at 1018 feet. Drilling resumed below 1350 feet. A small show of oil was noticeable in Bartlesville zone at 390 feet, and bit went into Mississippi lime at 400 feet.

In the Oskaloosa pool, Jefferson County, Northeastern Kansas, Dan McLaughlin and Jones have materials on location for McLeod 1, NW SW SW South of Oskaloosa pool. McCain & Sherrod have taken over Green 1, SWc NW 9-11s-19e, wildcat, and were drilling below 800 feet. Davis & Helm were original operators.

West edge of Falls City pool may be defined as water encroached at E. J. Shaffer et al's Sandrock 3, NW SW NW 20-1n-16e, which topped Hunton lime at 2260 feet and drilled in 10½ feet. More water and less oil continues to enter the pump. Southwest edge of the pool also found the water table high as Midland Oil Company's Towle 1, NE NW NW 29-1n-16e, earlier completed for a pumping potential of 314 barrels of oil, began making as high as 85 percent water.

Other producers having a noticeable increase in water are: E. J. Shaffer's Sandrock 1, NE SW NW 20-1n-16e; Sandrock 2, C N½ NE NW SW 20-1n-16e and Harry Harper et al's Sibbernsen 4, SW NW NW 20-1n-16e.

Bell Pipeline Company, which has a gathering system in the pool, cut loadings to five from a total of 20 tank cars daily. Production during November averaged approximately 2500 barrels daily. Lack of market for this crude has hampered developments and slowed down general interest in the wildcatting campaign.

Ekert & Longmire staked location in NE NW NE 16-1n-14e, a southwest diagonal offset to Arab Petroleum Company's Ogle 1, C SE SE 9-1n-14e, wildcat which checked structurally higher on Hunton lime than the discovery well. With elevation of 1070 feet, this test drilled into Granite Wash at 3420 feet and plugged at 3424 feet. Simpson sand was dry at 3207-42 feet, and Basal sand was topped at 3396 feet. Upper log revealed Topeka at 545 feet, Base Oread 770 feet, Lansing 900 feet, Cherokee 1785-2060 feet, Mississippian 2060 feet, Kinderhook shale 2100 feet, Hunton lime 2285 feet, Maqueota shale 2945 feet and Trenton lime at 3010 feet.

Illinois - Indiana

Washington and Clinton Tests Promise New Oil Pools

A pool opener was being completed in Washington County, and operators were preparing to test a show of Benoist oil at a Clinton County wildcat.

Eight miles west of the Cordes pool, Washington County, DeKalb Agricultural Company's Hunleth 3, SW NE NW 29-3s-4w, formerly listed as Hubbard's Hunleth 3, was pumping at the rate of 100 barrels of oil and 75 barrels of water a day from Benoist sand, topped at 1008 feet. Casing was perforated, but the well had not been shot. In its first test, the well made 165 barrels of fluid in 15 hours, of which 95 percent was oil. Two other tests on the Hunleth tract were abandoned a few months ago.

Eight miles north of Carlyle, Clinton County, Bell Oils, Inc.'s Maibaum 1, NE NE SE 12-3n-3w, was drilling plug to test Benoist saturation at 1156-59 feet. The well is 1000 feet northeast of Fox Maibaum 1, drilled more than a year ago and abandoned after unsuccessful tests of the Benoist. Bell Maibaum 1, at an elevation of 470 feet, topped the Benoist section at 1129 feet and encountered shaly saturation at 1152 feet. Better saturation was found at 1156-59 feet and casing was cemented at 1156 feet. The test ran 9 feet higher structurally than did Maibaum 1.

The pivotal St. Peter sandstone test in the old Sandoval field, Marion County, B. E. Martin's Robinson 1, SE SW 4-2n-1e, was drilling at 4900 feet. Some geologists estimate the St. Peter horizon will be picked up about 4950 feet, although others believe it will be deeper. As yet, the horizon is untested in the area. The Martin venture is being closely watched by operators throughout the basin.

First Trenton test in the Lake Centralia-Salem pool, Paul Rossi's Brooks 8, SW NE SW 29-2n-2e, was drilling at 4110 feet. Contract depth is 4600 feet. The well formerly was bottomed in Devonian lime, the field's deepest productive horizon at present, at 3432 feet.

A Jackson County wildcat, W. R. White's Ralph Dean 1, NE NW NW 18-9s-3w, near Murphysboro, was still testing a show of McClosky oil. Total depth was slightly below 1200 feet. Some oil has been recovered since an acid treatment.

Two new tests have started at Mason, site of a discovery well in Effingham County, Hinkle, Ruffner 1, offset to the discovery, and Rufus Troop's Ross Martin 1, just northwest of the village limits. An Effingham County wildcat, Jarvis Brothers' Retz 1, SW SW SE 13-7n-5e, was abandoned at 2706 feet with no shows reported.

White County's Calvin field was given a slight west extension with the near completion of Harris-Stuart's Ed Cox 1, SW SE SE 5-4s-14w. Oil was standing 1500 feet in the hole after plug was drilled, prior to an acid treatment in McClosky at 2914-21 feet.

A Fayette County wildcat, Kingwood Oil Company's Dayton 1, two miles west of Vandalia, E½ NW SE 14-6n-1w, was drilling below 1550 feet after finding all upper formations dry. Benoist was topped at 1402 feet, Aux Vases at 1440 feet, and St. Genevieve at 1497 feet. Another Fayette wildcat, Cherry-Kidd's Farber 1, SE NW 5-8n-1w, was abandoned at 1620 feet.

Another failure was chalked up in Perry County with abandonment of G. H. Blankenship's Anton Bednarkewicz 1, SW SW NW 24-4s-2w. At an elevation of 518 feet, it found the Tar Springs at 810 feet, Glen Dean at 915 feet, Cypress at 1128 feet, Benoist at 1285 feet, Renault at 1344 feet, Aux Vases at 1360 feet. Total depth was 1381 feet.

Joe Harding et al's Gottfried 1, NE NE NW 28-5n-4w, Bond County wildcat, damaged casing with a nitro shot and may be abandoned. Palestine sand at 595-630 feet was being tested, and a small amount of oil had been recovered previous to the shot.

An outpost test to the Cravat field, Jefferson County, Vawter's Modglin 1, SW 9-1s-1e, was abandoned through McClosky lime at 2350 feet. No shows were found. The test was ½-mile south of production. There are 11 producers in the field.

An important Edwards County wildcat, Don Baines' Nellie Hodgeson 1, NW NE NE 1-2s-10e, was fishing for tools at about 2900 feet. The well is near the town of Albion, and would start a townsite drilling boom if successfully completed.

In northwest Gallatin County, George and Arthur Cameron's Robinson 1, NW NW 4-8s-8e, was coring Pennsylvanian sand, topped at 1337 feet, and found a show in the upper part of the formation. The test is near The Carter Oil Company's pool opening York 1, which was completed in the Palestine sand at 1704-11 feet after also encountering saturation in the Pennsylvanian series.

First offset to a pool opener in southern Jasper County, The Pure Oil Company's I. Rohr 1, E½ SE NE 4-5n-10e, came in flowing natural from McClosky lime and was being tested. Two other offsets also were being completed. The discovery was initialed at 1300 barrels in 24 hours without an acid treatment.

Ohio River Wildcat Reports Ohara Saturation

L. F. Boone's Sand Island 1, upstream from Mt. Vernon, Indiana, and in the Ohio River, set casing to test promising Ohara saturation at 2630-42 feet. Hole was bottomed at 2650 feet. Nearest production is six miles northeast in the Caborn area of Posey County, Indiana.

Sun Oil Company's Heusler Dome field is about 10 miles east.

A Posey County wildcat near Welborn, Illinois Production Corporation's Jon Larkin 1, NE NE SW 17-6s-14w, was drilling at 2600 feet after coring only a water sand in the Cypress section at 2518-36 feet. About 16 feet of fair saturation was reported in the Tar Springs, topped at 2128 feet. The test is six miles south of Ribeyre Island production.

Anderson Griffin Properties, Inc.'s Frank O. Faul Heirs, NE NE SE 11-4s-14w, Posey County wildcat north of New Harmony field production and southeast of the South Griffin field, set surface casing.

A Warrick County wildcat north of Yankeetown, Yankeetown Development Company's Wilson Taylor 1, SW NW 10-7s-8w, inactive for several weeks at 1450 feet, has resumed operations and will underream to set casing and deepen to McClosky. J. Ervin Taylor and L. P. Hambuecken have taken an interest in the test. Bill Aggers will be in charge of operations.

In Pike County, Lockhart Township, just west of Stendal, Frank G. Ellison spudded Caroline Caldemeyer Heirs 1, NE 11-3s-7e.

In the Rockport gas field of Spencer County, James C. Ellis, Owensboro, abandoned J. Fred Fisher 1, SW NE 29-7s-6w, dry through the McClosky at 1643 feet.

Two new failures considerably cooled the play in the St. Thomas pool area, south of Vincennes, in Knox County. An attempted 4-mile north extension, W. C. McBride, Inc.'s John M. Brevort 1, Lower Prairie Survey 44, was abandoned after testing water in two McClocky breaks. Also abandoned without setting casing was Midwest Development Company's Sheldon Montgomery 1, SW Lot 4 fractional Section 12-2n-11w. Hole was bottomed at 1930 feet.

Showing for a McClosky producer was Loma Oil Company and Lewis Production Company's Ed Sannaman 1, NW SE 24-2n-11w.

A Jackson County wildcat in Grassy Fork Township, J. W. Pearson's William Turkhoun 1, NW SW 6-4n-5e, was abandoned after spudding to 41 feet.

In Benton County, Parish Grove Township, A. C. Thomas abandoned James M. Fowler 1, NW NW 27-25n-9w at 1750 feet.

A Crawford County wildcat in Whisky Run Township, Jim Bernett et al's Hugh Baylor 1, SE SE SW 22-1s-2e, was running casing to test gas in New Albany shale at 900 feet.

Kentucky

Surface Casing Set in Muhlenberg County Wildcat

In Muhlenberg County, ½ mile south of South Carrolton, Basin Drilling Company set surface casing for Nichols Brothers 1, Section 5-J-25, wildcat 10 miles from production.

In Graves County, 33 miles southeast of Paducah, John McKeel and Hank Riddle located Adair 1 on the east edge of the town of Farmington. Jack Cox, Owensboro, is contractor.

In McLean County, a mile southwest of Glenville, B. Cameron's J. F. Kerrick, Section 4-M-28, old Barlow producer, was being deepened to the McClosky.

North Texas

Jack County Test Delayed For Pressure Equipment

Production test of Continental Oil Company's Robertson 1, prospective deep strike for Jack County, was postponed late last week to move in pressure-control equipment to kill the well so as to install high-pressure connections and surface equipment. The well built up 1200 pounds pressure on casing soon after drilling plugs from 5½-inch casing at 5344 feet. Plugs were drilled with bit on 2-inch tubing string, with the hole bottomed at 5386 feet. This wildcat logged top of Mississippian at 5307 feet and Ellenberger at 5380 feet. Both zones tested oil saturation, although the former is believed to be the source of the production.

Follow-up development has been authorized by British-American Oil Producing Company as result of the performance of its recent Canyon lime strike on its Turbeville 1600-acre lease, Baylor County. Turbeville 1, near C N½ NE SE T&NO Section 198 and 2½ miles north of the Seymour pool, flowed 336 barrels of oil on 10-hour gauge after using 2500 gallons of acid in pay at 2514-22 feet. The Canyon is found near the same subsea depth in both areas. The company moved rig 934 feet northeast of Turbeville 1 for the drilling of its second test.

Phillips Petroleum Company has been a heavy purchaser of leases near Jack Kadane et al's Griffin 1, which recently extended the Griffin pool, Northwestern Archer County, 4000 feet to the east. The former paid $500 per acre cash and $750 per acre out of oil for lease on NE Section 12, being immediately south of the outpost producer, which flowed 344 barrels of oil the first 4 hours and 146 barrels the second 4-hour period through chokes from Strawn at 4337-49 feet. The original Griffin area has 2 Strawn producers and the same number of failures, involving north and south offsets to the flowing wells. These failures caused development work to be terminated since July, 1939.

Hull-Silk Pumper

Gulf Oil Corporation's Siegel 24 became the first pumper from the Bend lime in the Hull-Silk field, yielding 157 barrels of oil and 51 barrels of salt water in 17 hours. The well flowed heads due to the agitation of the pump. Production is from pay at 4634-46 feet, with the hole bottomed in hard lime at 4666 feet, and no appreciable amount of fluid was present before using 4000 gallons of acid. Magnolia Petroleum Company's Rutty 15, which proved dry at 4710 feet in Bend, topped at 4597 feet, plugged back to the Upper Strawn for a natural flow of 644 barrels of oil initial from sand at 3759-93 feet. Northwest extension for the Bend sector is promised by Helmerich & Payne's Wilmot 2, SEc G. N. Smith Survey, which logged broken saturation at 4624-44 feet. Production test is pending with 4½-inch pipe at 4613 feet. The latter's Jones 1, offsetting Bend producing leases, cemented 5½-inch pipe at 4619 feet to test broken saturation at 4618-30 feet.

Adams Oil & Gas Company's Turbeville 1, Archer County wildcat and 5 miles southeast of Archer City, cemented 5½-inch pipe on bottom at 5177 feet preparatory to perforating opposite saturation logged at intervals in the Bend, topped at 4725 feet. Electrical formation survey placed best pay zone at 4990-5010 feet.

The Vogtsberger area, Northeastern Archer County, has several outposts at decisive levels. Walter Gant and Feagin's Hunter-Hancock 1, H&TC Section 7, Block 1, 1¾ miles southeast of the discovery, was running pipe after drilling to the Ellenburger dolomite at 5370-91 feet. Oil saturation was found in the 4700-foot Strawn, which has accounted for two producers, and in the Bend at 5156-5210 feet, while the Ellenburger also registered sufficient oil saturation to warrant a test. Top of Bend was called at 5133 feet, or 14 feet lower than the discovery. W. B. Omohundro et al's Browning 1, southeast corner Block 7 and 2/3-mile northwest of Vogtsberger deep production, passed up broken saturation at 4704-91 feet, and was drilling shale at 4960 feet. The latter is 3 miles southeast of the Asylum pool, oldest Bend producing area in the district.

Gulf Oil Corporation's Worsham 3, south outpost for the Ringgold pool, Montague County, reflected its low structural position in yielding 31 barrels of oil and 26 barrels of salt water on 15-hour swabbing test at 5850 feet. Top of Bend was called at 5675 feet, with oil saturation at 5766-82 feet and 5818-24 feet. The hole is due to be plugged back for nitro shot. Walter Gant et al's Stine 1, 1-1/3 miles west of production, failed to show for an oil producer after small nitro shot and acid at 5600 feet, having plugged back by stages from 5673 feet, and is awaiting orders. Benson & Benson et al's Joe Benton 1, two miles southeast of Ringgold production, tested 60 feet of oil-cut mud in Strawn at 4914-30 feet, and was drilling at 5350 feet, with the Bend as its objective.

G. & M. Drilling Company and Wilcox Oil & Gas Company's Bullard 1, west offset to Owens & Hults' Bend lime discovery in Western Montague County, logged broken saturation at 6004-40 feet, in Bend, topped at 6004 feet, and is due to drill plugs from 7-inch at 6002 feet early this week. It is 5 feet lower than the discovery on the Bend marker. Development of this area will be followed with interest, since the discovery earned a potential of 2170 barrels natural from lime at 6016-50 feet, while other Bend areas in the county produce from conglomerate beds. Walter Gant et al's Will Laird 1, 9½ miles southeast of the above area, produces 30 to 35 barrels of oil along with a small volume of rotary mud on daily swabbing tests. Production is from perforations opposite Strawn pay at 4865-70 feet.

Benton-Holmes Extensions

Productive limits of the Benton-Holmes multiple-pay area, Eastern Montague County, were advanced north and east. The Texas Company's Custers 1 provided the east extension in pumping 70 barrels oil on 6-hour gauge from granite wash at 3686-3711 feet, with the hole bottomed in granite at 3712 feet. L. S. Flannery, Inc.'s First National Bank 2, north outpost, flowed an average of 35 barrels of 41-gravity oil hourly for 12 hours after making 32-shot perforations in casing opposite sand at 3805-13 feet. The hole was carried to 3903 feet before landing 7-inch

pipe at 3890 feet. Rig was skidded 50 feet west to drill a twin well to the 2900-foot discovery pay.

Seismograph survey is underway on R. W. Tolbert et al's 4000-acre Grayson County lease block, centering 3 miles southeast of Gordonville. Contract calls for the starting of a 6100-foot test before May 1. The Texas Company's Hutchinson 1, northwestern part of the county, was drilling at 4880 feet. Amon G. Carter et al's Harris 1, Denton County 7000-foot project, was coring at 6540 feet for a sample check. J. G. Hammond, Inc.'s Jester 1, Mallard area, Montague County, was drilling sand and shale at 6130 feet. In Northeastern Wise County, Manahan Oil Company et al's Collier 1, J. M. Wade Survey, was drilling at 4810 feet, while in Tarrant County, Sullivan, Hill & Hill, Inc.'s Putman 1, 2 miles northeast of Saginaw, was drilling shale at 4690 feet.

Rathke Oil Company and R. C. Parker's Mosely 1, Ordovician project for the Joplin area, Jack County, was drilling black shale at 5050 feet. No shows have been reported since testing small volume of gas with oil spray at 4745-50 feet.

In Throckmorton County, Humble Oil & Refining Company's Durham 1 entered the Mississippian at 4949 feet with nominal oil saturation in lime at 4995-5002 feet, and was drilling dolomite at 5110 feet.

Jones County Test Has High-Gravity Oil in Hole

An oil strike from the Flippen sand near the south line of Jones County is indicated by Danciger Oil & Refineries, Inc.'s Kelso 1, SWc Block 82, DeWitt County School Lands Survey No. 126, which filled 500 feet from top with high-gravity green oil after drilling sand at 2335-37 feet. Casing is cemented on top of the Flippen at 2335 feet for a production test early this week. The company holds lease on a 785-acre block, and half of the royalty under same. Kelso 1 encountered a thinning of the section after reaching the Saddle Creek, and is credited with being 110 feet higher on the Flippen than Fain-McGaha Oil Corporation's Harris 1, a mile west, which logged show of oil at 2470-76 feet and 2575-88 feet, and abandoned at 2905 feet.

Texas Permits

Permits for drilling 254 new wells were approved last week by the Texas Railroad Commission, 143 more than were authorized the week before.

A total of 30 permits were granted in the East Texas field, with 27 in Gregg and three in Rusk County. From the remaining portion of the East Central Texas area, 13 locations were reported.

First place was held by the Southwest Texas district, with 64 permits, including 10 in Jim Hogg County, while Gulf Coast operators were allowed to drill 27 wells.

The commission approved permits for 48 wells in West Texas, including 11 in Ector, and producers in West Central Texas reported 21 locations.

Fromme Hearing

Hearing has been called by the Texas Railroad Commission for December 18, at Austin, to consider special operating rules for the area around the Davis & White's Ed Fromme 1, Section 110, Block 10, H&GN Railway Survey, Pecos County.

West Texas

Silurian Discovery Boosts Flow on Second Treatment

Development of the Silurian horizon recently proven for oil and gas production in the Shipley area, eastern Ward County, will be forthcoming as result of the discovery materially boosting its flow after second acid treatment. Holding the distinction of being the first in Texas to produce from the Silurian, Gulf Oil Corporation's Wristen 5 flowed 1706 barrels of 32-gravity oil through open tubing in 17 hours after reacidizing with 6000 gallons. The well previously flowed 602 barrels oil initial with gas/oil ratio of 3223/1, after washing with 1000 gallons of acid followed by the use of 3000 gallons under pressure. The third stage treatment reduced the ratio to 1041/1. The gas carries a trace of sulphur.

Production is from saturated zone at 7010-60 feet in Silurian, topped at 6930 feet with an elevation of 2501 feet, according to the master log. Base of Permian is placed at 6330 feet. Top of the Simpson and Ellenburger markers are listed at 7375 and 9002 feet, respectively. Wristen 5 was drilled to 9187 feet, and lost junk in the hole before a production test could be made of promising oil saturation logged in the Ellenburger. Hole was plugged back to 7075 feet to complete in the Silurian, with 7-inch pipe cemented at 6968 feet. Wristen 5 encountered 170-foot section of Silurian, as compared to 190-foot section found by Gulf Oil Corporation's McElroy 103, deepest test in the district, and established a district record in logging a 1627-foot section of Simpson.

Independents and majors own leases on acreage adjoining the Wristen discovery tract to the north, west and south.

Record flow for the Lower Permian zone in the northeast portion of the Sand Hills field, Crane County, is indicated for Gulf Oil Corporation's Waddell et al 14, ½ mile east of production. This outpost flowed natural at rate of 2865 barrels initial at 4524 feet, and responded to treatment with 5000 gallons of acid with a flow of 314.64 barrels oil the first hour, followed by 223.56 barrels the next 30 minutes. The valve was opened gradually during the first period because of the volume, and the ½-hour test was through open 2-inch tubing and two 4-inch casing lines. Humble Oil & Refining Company's Tubb 46-X, Ellenburger producer for the south end of the field, plugged back from 5794 to 5778 feet after testing 15 to 40 percent bs&w. Top of Ellenburger was called at 5762 feet, or 3203 feet subsea, being 16 feet lower than the nearest Ordovician producer.

Shallow operations in northern Pecos County are due to expand as result of two recent discoveries and expansion of the Lehn pool to the northwest. The latter development involved Kemper Kimberlin et al's Boren-Humble 1, which flowed 50 barrels initial on natural gauge from broken pay at 1696-1716 feet. Top of brown lime was called at 1305 feet, with an elevation of 2644 feet. Davis & White's Fromme 1, ½ mile east of shallower production in the Shearer pool, has been designated as a separate pool, and Tex Pattillo et al's O'Neal 1 made a small flowing well at 1675 feet while pointing for the Ordovician.

Terry County has 3 active wildcats. Denver Producing & Refining Company's Lewis 1, SEc Section 62, Block DD, J. H. Gibson Survey, was drilling at 4800 feet, having logged top of Yates sand at 3390 feet, or 88 feet subsea. Sloan & Zook Company's Bailey 1, C NW NW S&M Section 103, Block 4-X, was drilling at 5520 feet, with an elevation of 3341 feet. First brown lime was called at 4420 feet and solid lime at 4940 feet. Gulf Oil Corporation's Mallet 4, 2½ miles west of production in the Slaughter field, was drilling at 5740 feet with an elevation of 3545 feet. The latter missed the regular Permian pay, and was making the first try for the area for the Holt, or Clear Fork lime.

Southwest Texas

Agua Dulce Extension Has Showing in New Sand

Exploration of the flanks of present distillate structures continues to provide new production along the South Texas Gulf Coast. F. A. Gillespie & Sons' Dabney 1, Section 80, and nearly two miles east of the Agua Dulce field, found a new sand for the area and on production test made gas and distillate. The hole was drilled to 7503 feet, then plugged back and perforated at 7216-21 feet, resulting in a flow of several barbers of distillate and a large volume of gas through ⅛-inch choke, pressures developing to 2400 pounds on tubing and 2600 pounds on casing.

In Aransas County, Gulf Board Oil Corporation completed the fifth squeeze job in State 1, on the Mud Bay prospect and was again testing. The well is attempting completion in a 9100-foot sand, which may result in the discovery of a new submerged oil field in Aransas County. Hole had been carried to 9257 feet, then plugged back.

The East Premont field of Jim Wells County was being widened one mile northeast by Magnolia Petroleum Company's Seeligson 14, which was testing. The hole was drilled to 6802 feet and casing was set at 6756 feet.

One new field was promised and several other wells were at critical depths on the South Texas Wilcox trend. Casing had been set on bottom at 8521 feet in McMurrey Drilling Company's A. C. Allen et al 1 in the Muldoon Survey and preparations were being made for a production test. The Wildcat, 12 miles east of Hallettsville and 2 miles west of Colorado County line, had several showings in the Wilcox formation, encountered at 7566 feet, found sand with oil odor at 8463-67 feet, sand oil odor at

8491-8506 feet and salt water sand at 8506-21 feet, total depth 8521 feet.

The Shell Oil Company's northeast outpost to the Sheridan field in Colorado County found several sands below the regular 8100-foot Wilcox sand and set casing for a production test, about ⅓ mile northeast of the field. The hole was carried to 9200 feet.

A new sand for the Bruni field of Webb County was opened through completion of Highland Oil Company's A. M. Bruni 4, at 3973 feet, for 45.45 barrels of 44-gravity oil per day through a ⅛-inch choke. Pressures mounted to 470 pounds on the tubing and 1150 pounds on the casing. This well originally was completed at 3412 feet for 25 barrels per hour through a ¼-inch choke, then drilled to present depth. Sand was encountered at 3404-12 feet and the top of the lower sand was found at 3938 feet. Production is from the Cook Mountain zone.

East Texas

Woodbine Wildcat to Receive Heavier Pumping Unit

Pumping test given Bobby Manziel et al's Morrison 1, prospective producer from the Woodbine in the Hawkins area, southeast Wood County, averaged 20 barrels of fluid hourly, including 85 percent BS&W. Heavier pumping unit was being installed. The oil production is expected to increase on removal of a head of water that accumulated during the two months that the well has been in process of completion. Production is from casing perforations at 4909-16 feet.

Manziel et al have moved in equipment to start Lee Bell 1, situated in the most easterly northeast corner of Ed Wideman Survey and a short distance northwest of Hawkins townsite. Jackson & Rotundi's Cobb 1, projected Woodbine test for the townsite, was drilling at 3100 feet, having logged Nacatoch sand at 2245-75 feet.

Saunders 1, situated on edge of Franksston, Anderson County, was reported idle in shale at 4876 feet. Considerable lease and royalty trading has occurred in the area since this wildcat indicated high structural position on the chalk markers.

Third producer for the Barron deep gas-distillate pool, Groesbeck area, Limestone County, was assured when C. L. Brown et al's Ethel Barron-Magnolia 1, south offset to the discovery, recovered saturation in the Pettit zone, topped at 5568 feet. The test was halted at 5662 feet to run electrical formation survey, and to set pipe. The usual thin section of anhydrite was logged at 5052-66 feet.

C. S. Amis and Dawes Hardin's W. R. Hammond 1, projected Lower Trinity test for a Limestone County block, centering 1½ miles northwest of Kosse, was drilling at 5200 feet. Top of Georgetown lime was placed between 3490-3500 feet and Upper Glen Rose at 4290-4300 feet. This test is near the late Col. A. E. Humphreys' Jones 1, which blew in August 18, 1922, flowing in excess of 5000 barrels of oil daily supposedly from a crevice near the 3767-foot level. The discovery developed a junked hole after producing 27,000 barrels of oil, and later failed to find the oil zone. Frank Bryan and Farrell Drilling Company's Beville 1, promising Lower Trinity prospect in the Horn Hill community, Limestone County, will defer a production test at 4937 feet until early next year. Gulf Oil Corporation has contracted to purchase Bryan's interest in the well and block when title requirements are fulfilled.

Gulf Oil Corporation's Venters 1, west offset to the Pittsburg pool discovery, Camp County, was drilling at 6050 feet. Top of Georgetown lime was placed between 4530-60 feet and based at 5213 feet, with an elevation of 385 feet. First Paluxy was called at 5627 feet, being 53 feet high.

Shell Oil Corporation has taken over Delta Drilling Company's Browning-Shell 1, half-mile northeast outpost for the Chapel Hill field, Smith County, after the latter fulfilled contract in drilling to Upper Glen Rose at 5876-81 feet. Delta Drilling Company's rights were restricted to the Paluxy, entered at 5620-30 feet, with an elevation of 425 feet, and the zone proved barren. Sun Oil Company authorized the drilling of Dickerson 1, northeast corner of 159.1-acre lease, Jas. Holden Survey, A-447, and a mile southwest of gas-distillate production. Sun Oil Company and Shell Oil Company's Walton 1, Levi Hands Survey, was drilling at 5660 feet with an elevation of 476 feet. Paluxy was entered at 5565 feet.

Negotiations are pending for the construction of an additional natural gas pipeline from the Chapel Hill area to serve shutin gas-distillate wells. Hunt Production Company's Bradley 1, which discovered the pool with a prolific gas-distillate well from the lower Glen Rose in July, 1938, is credited with having produced 14,250 barrels of distillate in November, 1940, while delivering 187,300,000 feet of gas to the East Texas field. Total of 265 wells in the latter field are utilizing this high-pressure gas. The gas is transported by the Chapel Hill Gas System, which also handles gas on a common carrier basis for other Chapel Hill field producers.

The drilling of inside locations in the East Texas field currently involves a greater volume of work than has occurred in the past 18 months. Survey reveals 17 drilling tests, and a total of 31 operations. The bulk of the activity is on leases that have been developed beyond the field's average density of one producer to 5.1 acres. Numerous permit-to-drill applications that were denied in past years have been approved lately.

Pickup in drilling towards the end of the year has been noted before, as some operators speed up development programs in order to incorporate their new wells within a given tax period. The work is now almost entirely confined to independent properties.

The plugging of depleted oil wells and new completions tend to even up in numbers to maintain total producing wells at a nearly constant level. The field reached its peak with 26,061 wells on the official proration schedule about mid-August, 1939, and total wells have been below the 26,000 mark since last March, with a minimum of 25,011 wells listed early last month.

Texas Gulf Coast

New Oil Sand at 6525 Feet for La Belle Field

Sun Oil Company found the second oil sand at La Belle field, Jefferson County, at 6526-46 feet. Potential flow from Broussard-Hebert 8 was 265 barrels daily through 36 perforations, ¼-inch choke, tubing pressure 225 pounds, with casing sealed. Two and one-half inch tubing was set at 6615 feet. The company staked Broussard-Hebert 9, 1000 feet southeast of Broussard-Hebert 8, and 730 feet south of Broussard-Hebert 3, gas-distillate producer. The company's Broussard-Hebert 7 found the first oil sand in this gas-distillate field at 7265-70 feet. Producing horizons now number three gas-distillate in addition to the oil pays.

Stanolind Oil & Gas Company made another well in the Rowan distillate field, Brazoria County. Burgess 1, 1660 feet southeast of the company's Hodnett 1, set 7-inch casing at 8548 feet, perforated 8537-47 feet, and was cleaning into pits through 3/16-inch choke, with 1550 pounds pressure on tubing, 1500 pounds on casing. Humble Oil & Refining Company drilled Hubbard 3, north outpost, past 6300 feet, and staked Hubbard 4, 1700 feet northeast of production.

In the Joyce Richardson (Ogburn) field, northwestern Harris County, Christian-Carpenter Drilling Company perforated Backen 1, south offset to the discovery, at 6448-51 feet, ran 2½-inch tubing and kicked the well off with gas, obtaining oil, wash water and salt water, flowing into pits. This is a new sand for the field, and may have commercial quality, as tubing pressure was 900 pounds, casing pressure 600 pounds. Tests in the regular pay for this sector of the field have disappointed, the first yielding 600 feet of salt water and 5 percent distillate from 6970-80 feet, with 1400 pounds pressure, via ¼-inch choke, the second yielding a little gas and distillate from 6930-39 feet. The 6450-foot section now being tested appears the best bet for production as drill-stem test at 6453-59 feet recovered 300 feet of oil with no water in 14 minutes, ½-inch chokes, 500 pounds pressure, while perforations at 6460-70 feet recovered 1000 feet of oil and 1000 feet of water in 20 minutes, with pressures low.

H. C. Cockburn was completing two wells, ninth and tenth for the field, at Dyersdale, Houston area, Harris County. Burkett 15, west side test, had casing set at 4100 feet for completion in the regular Frio pay. Burkett 7, south side well, was waiting on cement, with casing set at about the same depth. Both wells had normal sand sections. Development of this field has been extremely rapid, as the conditions of shallow pay, fast drilling, and a premium crude for lube stock have encouraged Cockburn to drill nine wells, with locations made for 14 more, and one successful test by J. M. English.

Potential for Humble Oil & Refining Company's State 3-A-248, oil discovery in the Red Fish Reef distillate field, Galveston Bay, Chambers County, was 156 barrels of 35.6-gravity oil daily

through ⅛-inch choke, 1725 pounds pressure in tubing, casing sealed, from Hackberry sands at 10,327-343 feet. Both the company and Gulf Oil Corporation augmented their marine operations in Galveston and Trinity bays with new locations. The former staked State 7-C-55, 3100 feet southwest of the discovery at Fishers Reef, Trinity Bay, while latter obtained a War Department permit for State 2-R-224, 2 miles north of Red Fish Reef, and offsetting 1-R-224, which was drilled past 9100 feet. Humble Oil & Refining Company prepared to complete State 7-A-264, south outpost at Red Fish Reef, cementing casing at 9710 feet. The company's State 8-A was waiting on cement at 3025 feet; State 9-A-263 was drilling in lime at 7198 feet. At Fishers Reef, State 5-C-45, offsetting the discovery, was drilling at 9025 feet in shale. Standard Oil Company of Texas-Salt Dome Oil Corporation's State 1-47, 3000 feet northwest of the discovery, was waiting on cement after setting 10¾-inch casing at 2095 feet.

Prospects for another marine campaign were born last week at Austin, where the State Land Board accepted bids totalling $82,082 for leases on 25 submerged tracts of public school land along the Gulf of Mexico, most of them in Matagorda Bay. Largest bid was made by Sinclair Prairie Oil Company, $14,200 for 614 acres in Matagorda Bay. The company applied for permission to withdraw the bid because of proximity to an army bombing range in the bay, but was denied. Two tracts in the Colorado River bed in Wharton County were also leased.

Phillips Petroleum Company was attempting to add new pay sands at Chocolate Bayou, Brazoria County, deepest producing area in the state. Houston Development Farms Company 1, 1¼ miles west of Andrau 1, 11,430-foot distillate producer, was testing sands between 9800 and 9900 feet, while the company's Triangle Development Company 1, a mile east of Andrau 1, was coring at 10,920 feet.

Wildcat activity featured 3 new locations. In Waller County, Brookshire area, on the east flank of the San Felipe dome, John Mayo and T. A. Carlton Drilling Company staked Donigan 1, 8000-foot Wilcox test in Wm. Cooper Survey. Another Wilcox test, R. A. Irwin and W. G. Meunch's Schoenfeld 1, was staked in the R. O. Lusk Survey, Magnolia prospect, on a farmout from Standard Oil Company of Texas. Humble Oil & Refining Company is also contributing a block to the test. Pan American Production Company moved in for Koontz 1, HT&B Survey, Section 14, at Damon Mound, Brazoria County.

North Cedar Creek Hearing

Two-acre spacing for the North Cedar Creek field, Bastrop County, was requested by Anderson and Dickey at a hearing before the Texas Railroad Commission last week.

The operators have three wells producing from a serpentine plug found at 1620 feet. They plan to drill only one well to 10 acres now, but because of erratic structural conditions, they asked permission to drill the wells closer together where needed.

Louisiana Gulf Coast

Oil Production Opened at East Tepetate, 3315 Feet

H. L. Carnahan opened the first oil production in East Tepetate gas field, Acadia Parish, completing McManus 1-B, southeast corner of Section 21-7s-1w, for 150 barrels of 26-gravity oil daily via ¼-inch choke from 3315-25 feet. The sand is the one which flowed 25 barrels of 25-gravity oil daily through ¼-inch choke from 3525-35 feet under 680 pounds tubing pressure in Vincent & Welsh and E. J. Nicklos' McManus 1, northwest of the current completion, before this horizon was abandoned to make a gas-distillate completion at 3528-33 feet. Acreage in the area is checkerboarded, with Humble Oil & Refining Company, Gulf Oil Corporation, Sun Oil Company, Tide Water Associated Oil Company, Vincent & Welsh, E. J. Nicklos and Continental Oil Company owning leases.

Gulf Oil Corporation had not tested Timolat 1-B at the end of the week, operations being delayed by difficulty in running the liner. This wildcat in Section 36-22s-30e, West Bay, Plaquemines Parish, was regarded as a cer-

Patent Pending

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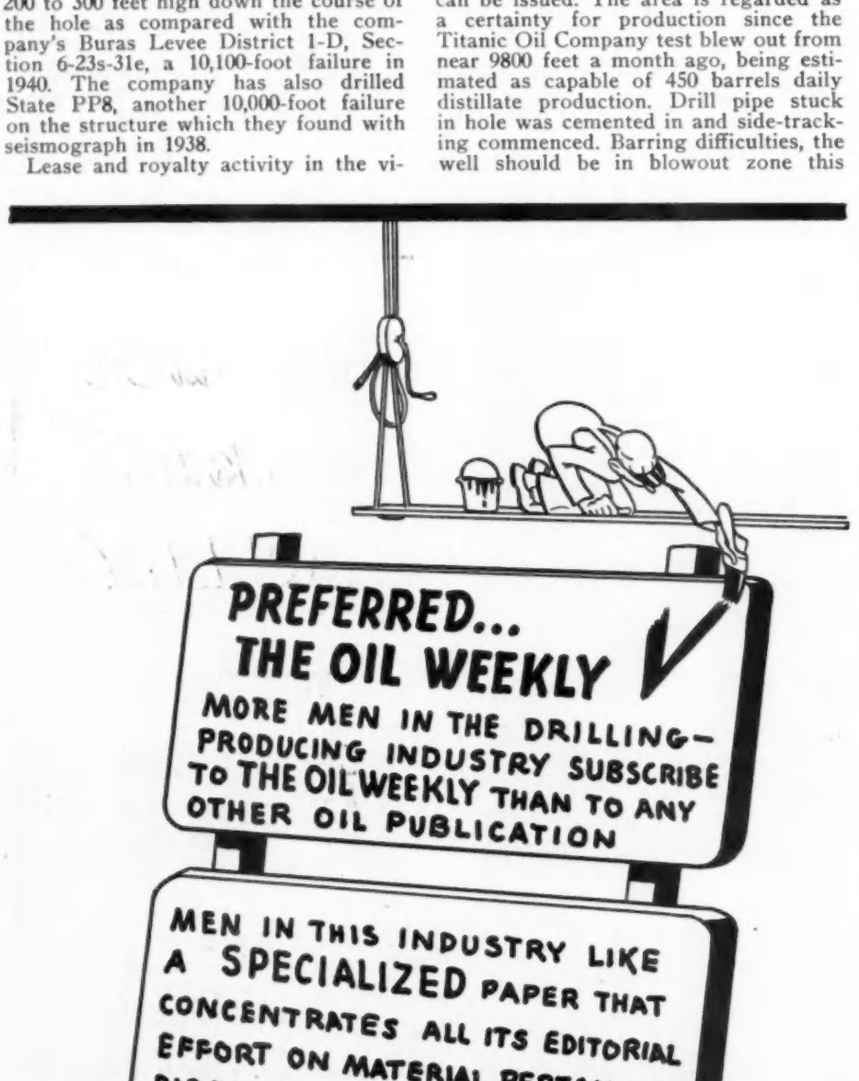
tain field opener since 8-minute drill-stem test at 7267-80 feet recovered 5300 feet of 32-gravity oil under 170 pounds working pressure, with 3/16-inch top choke and ¼-inch bottom choke. This section will be tested first, although sand section at 5045-65 feet registered 50 mv and 5 ohms on electrolog. Electrolog also revealed possibilities at 6392, 6616, 6730 and 7010 feet. The test, third for the prospect, is reported running 200 to 300 feet high down the course of the hole as compared with the company's Buras Levee District 1-D, Section 6-23s-31e, a 10,100-foot failure in 1940. The company has also drilled State PP8, another 10,000-foot failure on the structure which they found with seismograph in 1938.

Lease and royalty activity in the vicinity of Titanic Oil Company's Marrero Land Company 1, on the Gretna prospect, New Orleans area, Jefferson Parish, continued. Shell Oil Company, sub-leasor of the Marrero Land Company tract, was successful bidder on 55 acres of Public Belt Railroad Commission land, paying $15,900 bonus and $7,950 annual rental, plus 1/48 override. It was reported that the company will start a test as soon as the permit can be issued. The area is regarded as a certainty for production since the Titanic Oil Company test blew out from near 9800 feet a month ago, being estimated as capable of 450 barrels daily distillate production. Drill pipe stuck in hole was cemented in and side-tracking commenced. Barring difficulties, the well should be in blowout zone this week. Phillips Petroleum Company has entered the play with purchase of 50-acre lease north of the well.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TO AVOID MISSING A SINGLE COPY, ALWAYS RENEW YOUR SUBSCRIPTION PROMPTLY AND ADVISE US OF YOUR NEW ADDRESS WHEN YOU MOVE

Superior Oil Company drilled into salt in Stuart et al 1, Section 28 Dome test, Section 29-9s-7e, St. Martin Parish, and plugged back from 9676 feet to attempt to complete in the 9129-95-foot section where 5 sets of perforations flowed 980,000 feet of gas and 12 barrels of 53.7-gravity distillate daily through 9/64-inch choke, under 2500 pounds pressure, to indicate an almost certain gas-distillate discovery. Attempts to complete were delayed by faulty plug, which was replaced. Operations on St. Martin Land Company 1-B, derrick 900 feet north of Stuart 1, in Section 20-9s-7e, will be held up pending the completion. The company's St. Martin Land Company 1-A, 2 miles south of Bayou Bouillion, was drilling at 8188 feet. This test indicated a new flank sand when it cored gas and distillate section at 7497-7507 feet. The company abandoned State-Lake Calcasieu 4, Section 1-14s-9w, wildcat in Lake Calcasieu, Cameron Parish, at 8664 feet after drilling into salt in the original hole, and deviating twice.

Stanolind Oil & Gas Company's School Board 23-B, NW¼ Section 16-12s-10w, deepest test ever drilled in the West Hackberry field, Cameron Parish, was closely watched as electrolog was run to bottom at 10,627 feet. The company completed State Land 57, same section, for 378 barrels through 3/16-inch choke from 9656-82 feet, under 1350 pounds tubing pressure, with casing sealed. Gulf Oil Corporation scored a short east extension for the Jennings field, Acadia Parish, completing Arnaudet 44, Section 47-9s-2w, for 390 barrels daily through 3/16-inch choke, pressure 1150 pounds from perforations at 7574-84 feet. The company will apparently be successful in their first well in the Ville Platte field, Evangeline Parish, as Vidrene 1, Section 39-4s-2e, on the southeast side, was perforated at 10,090-110 feet for production test of the only good section logged.

Plymouth Oil Company made its third well in the Bayou Pigeon field, 1940 Iberia Parish discovery, gauging 8 barrels of 35-gravity oil hourly via ⅛-inch choke from perforations at 8050 feet in State 1, Section 24-12s-10e, in the bayou. Pressure on tubing was 625 pounds, with casing sealed. On 9/64-inch choke, the well made 11 barrels hourly. Initial tests of the regular 8050-foot pay recovered salt water and it appeared doubtful that a well could be made. The company has staked Iberia Cypress Company 1, Section 14-12s-10e, and Kyle Lumber Company 1, Section 24-12s-10e, both north and northwest of present production, the former location a mile northwest outpost.

Shell Oil Company failed to establish a deeper sand as a sequel to 8200-foot development at Iowa, Calcasieu and Jefferson Davis parishes. The test, Heyd 32, Section 13-9s-7w, near the center of the field, heralded as a deep sand discovery, flowed 1,300,000 feet of gas daily from 8750-8763 feet, under 2200 pounds pressure. Perforations were squeezed for another test in the 8200-foot horizon, perforations at 8210-22 feet having recovered salt water. Perforations were made at 7580-7600 feet for more tests in a shallower sand. A drill-stem test of the 7580-foot level recovered 25 feet of distillate and sand. Later test of the same section recovered 100 feet of oily mud, 90 feet of clean oil, and 500 feet of salt water. Magnolia Petroleum

Company's Waite 16, Section 12-9s-7w, north side test, was drilling below the 8200-foot objective. Sid Richardson's Sweet Lake Land & Oil Company 1, 2000 feet south of production in Section 24-9s-7w, was drilling at 8500 feet. So far, the predicted completions outside the bounds of shallow production have not been made.

At Paradis, St. Charles Parish field with sand sections the subject of much interest, The Texas Company completed LL&E-Paradis 7, Section 7-14s-20e, for 550 barrels daily through 3/16-inch choke from perforations at 10,308-83 feet. W. P. Luse and McAdams shut down Pyregene 1, 2 mile south outpost, for repairs. Bottom of this test, which ran very low with the field wells, was at 11,280 feet.

Humble Oil & Refining Company had its third test at Bayou Des Glaise, 1940 Iberia Parish discovery, near the completion stage. Wilberts 3-B, directional test in Section 78-8s-8e, drilled out plugs at 8911 feet and drilled to 8931 feet. An oil sand was logged at 8780-90 feet, and completion attempt is expected in this zone. The discovery, only successful test to date, was completed at 8650-60 feet for 345 barrels of oil daily.

Shell Oil Company's recent oil discovery at La Pice, St. James Parish, has stimulated activity. The company staked Schexnayder Community 1, Section 38-21s-15e, while Danciger Oil & Refining Company took a farmout from Shell Oil Company on a tract in Section 42-12s-15e, a mile southwest of Federal Land Bank 1, the oil discovery which flowed 450 barrels of 38-gravity oil daily from 7650 feet.

Phillips Petroleum Company staked State 1, wildcat in Section 48-20s-29e, Plaquemines Parish, northwest of the Venice field, and west of the Mississippi River. Stanolind Oil & Gas Company abandoned State 1-200, Bay Junop, Section 35-21s-14e, Terrebonne Parish, after sidetracking to 9351 feet. Original hole was drilled to 11,003 feet. H. C. Cockburn's Gianionelli Estate 1, Section 58-8s-1e, East Baton Rouge Parish, 6½ miles southeast of the University field, ran electrolog to bottom at 8390 feet, and was waiting on orders.

Ask Higher Allowable for Cordele Field, Jackson County

Higher allowables for the Cordele field, Jackson County, were requested at a hearing before the Texas Railroad Commission last week. H. J. Porter said that some of his wells which produce water were killed when closed in to meet shutdowns.

Porter requested that the allowable be increased approximately 1000 barrels daily by removal of shutdowns and a slight increase in the allowable. Mirando-type crude produced would be purchased by Crown Central Petroleum Corporation.

Gulf Safety Engineers Plan Christmas Party

The annual Christmas party of the Gulf Coast Chapter of the American Society of Safety Engineers will be held at 7:30 p.m. December 19 at Ye Old College Inn, 6545 South Main Street, Houston.

Entertainment has been arragned by a committee headed by J. E. Niland, Humble Oil & Refining Company. Reservations are being taken by Charlie Boone, Gulf Oil Corporation, Fairfax 7131.

North Louisiana

Leasing in Eight Parishes Continues to Gain Momentum

The leasing campaign "in the trend" just south of the Angelina-Caldwell Flexure in North Louisiana continued to gain momentum last week indicating a wide wildcat leasing program in that area early in 1941.

Leasing is active in Caldwell, Catahoula, Concordia, Franklin, La Salle, Ouachita, Tensas and Winn parishes. Producing possibilities of the shallow Wilcox, found productive at Olla and Nebo (Jena), both in La Salle Parish, is the spur for the leasing activity. This formation has a thickness of approximately 2700 feet. Three wildcats in La-Salle Parish spudded last week.

Despite a wildcat abandonment at 3002 feet in Tensas Parish, leasing continued active last week. T. J. Sanders leased approximately 2000 acres in Township 11 north, Range 12 east. H. L. Hunt leased several hundred acres in Township 13 north, Range 10 east, for a 3000-foot test to start by next January 15. Continental Oil Company is reported to have farmed out for immediate development a wildcat block it holds in Tensas and Madison parishes, between Tallulah and Newellton, for a 6000-foot test.

Dale & Dale of Vidalia, Louisiana, assembled a block around Section 25-9n-9e, Concordia Parish. H. L. Hunt continued to take scattered leases in Township 14 north, Range 9 east, Franklin Parish. In Townships 16 and 17 north, Range 1 east, Ouachita Parish, The Texas Company added to a 4000-acre block, and the same company leased several hundred acres in Township 6 north, Range 7 east, Concordia Parish.

Lisbon Test Passes Show

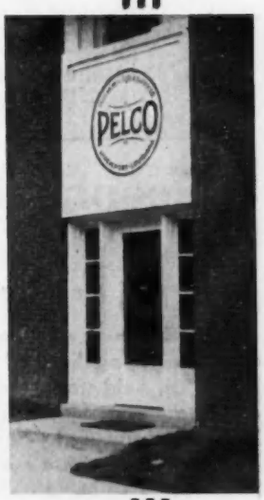
Two and one half miles north of production at Lisbon, Claiborne Parish, Union Producing Company's Meadows A-1, C NE 18-21n-4w, an 11,000-foot test, logged two feet of Lower Marine formation at 10,178-80 feet carrying an odor of gas and oil but later drilled ahead at 10,215 feet.

J. D. Carruthers and associates' Burgess-Simmons 1, C W½ SW 2-20n-5w, second Lower Marine test at Lisbon, waited on cement to set after electrical log was run to total depth of 9008 feet. Casing will be perforated for production test next week.

Skelly Oil Company and associates' Volentine 1, NW NW 31-20n-6w, Claiborne Parish wildcat, that tested estimated 25 million cubic feet of gas and a spray of oil at 6317-32 feet, made another attempt to test last week but perforations were not squeezed off satisfactorily, and preparations were made to install Christmas tree and separator and attempt another production test at 6317-6332 feet. Total depth is 6507 feet and

Speaking of Good Scouts...

February 8th will be the thirty-first anniversary of the Boy Scouts of America. We were two years old when the movement was founded. There is no connection, except that we have known a lot of good scouts in the oil business. Point eight in the Scout Law says that "A scout is cheerful. He smiles when he can." A nice thought, and important. You don't find good cheer in the hearts of selfish men, and oil men are almost universally of good cheer. We wouldn't by choice have served any other industry for 33 years.



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the showing of gas was in the Travis Peak.

Having reached contract depth of 6000 feet, Superior Oil Corporation of Tulsa, prepared to run casing and plug back for a test of the Paluxy at 3678-85 feet where an estimated three to five million cubic feet of gas showed when formation tester was run in Pickering Lumber Company 4, S. T. Crane Survey, a Shelby County, Texas, wildcat. With elevation of 318 feet this test topped first anhydrite at 5330 feet and topped massive anhydrite at 5410 feet. Salt water with a slight showing of gas resulted from a drill-stem test at 5653-5670 feet.

Arkansas

Two Deep Smackover-Lime Tests Among New Starts

Locations for two Smackover lime deep wildcats were made last week in South Arkansas, both in Union County. One of the locations, for a cooperative test to be drilled by Crescent Drilling Company, is tentative, but will be somewhere in Section 13-18-17. The other, on a block of 3600 acres, is C. H. Murphy, Jr.'s Cats S-1, SW NW SW 33-18-15.

Charlton H. Lyons made location for the first of a series of three 3000-foot tests in the Urbana field, Union County, on a 60-acre farmout from Root Petroleum Company. First test will be P. Winn Estate 1, SW NW 11-18-13.

John Carter and Paul Christmas, of Houston, have secured a 2500-acre free block for a 2500-foot wildcat test in Section 10 or 11-11s-20w, Nevada County.

Six drilling permits were issued last week by the Arkansas Oil & Gas Commission, as follows: Columbia County—Louark Producing Company's D. E. Booth B-1, C NW NE 20-17-19; Nevada County — Berry Asphalt Company's C. C. Fincher 4, SW NE 10-14-20; Union County—Bob Milam's G. J. Childs 1, NE SE NE 8-16-16; C. H. Lyons' P. Winn Estate 1, SW NW 11-18-13; C. H. Murphy, Jr.'s Cates C-1, SW NW SW 33-18-15; Stacy-Erwin's C. T. Grace 5, SE SE 31-17-14.

Louisiana Permits

Thirty-three drilling permits were issued last week by the Louisiana Conservation Commission, of which 16 were in North Louisiana in the following parishes: Caddo 5, DeSoto 1, LaSalle 7, Natchitoches 1, Red River 1, and Webster 1. The 17 in South Louisiana were in the following parishes: Calcasieu 1, Jefferson Davis 2, Lafourche 2, Plaquemines 5, Rapides 1, St. James 1, St. Mary 2, St. Martin 2, and Terrebonne 1.

Tinsley Dome Production Reaches 3,700,000 Barrels

Total cumulative production of the Tinsley Dome field, Yazoo County, Mississippi, discovered August 29, 1939, is 3,700,000 barrels coming from 102 wells. Operators are adhering to allowable agreements and production and tank-car shipments remain fairly consistent.

Tank-car shipments for the week ended December 4 by companies follow: Union Producing Company, 53,244 barrels; E. C. Johnston, 30,720 barrels; Slick-Urschel Oil Company, 18,480 barrels; Hassie Hunt and Magnolia Petroleum Company, 16,300 barrels, and Jones & O'Brien, 4,320 barrels. Daily average production for the week was 16,069 barrels.

Southeastern States

Kemper County Test Has Oil and Gas Show

A showing of both gas and oil on the pits at R. M. Crabb et al's Land 1, NW NE 12-10n-14e, Kemper County, Mississippi, near DeKalb, has caused considerable leasing in that vicinity. Operators are shut down to cure titles preparatory to running electric log before making a test. The showing is in the Eutaw (Blossom) sand. With elevation of 402 feet, the test topped chalk at 872 feet and Eutaw at 1570 feet. A core at 2140 feet recovered a sand but no showing, but at 2160 feet the showing appeared. Location is 25 miles north of the city of Meridian.

Thirty-four geophysical units were at work in Mississippi and Alabama last week, slightly more than half the number that were at work in the two states a year ago. As the end of 1940 nears, operators have had to admit that the great exploratory campaign that resulted from discovery of oil at Tinsley Dome, Yazoo County, Mississippi, in late August, 1939, has not brought the results anticipated.

One new wildcat location was made in Mississippi: Higgason & Dill's Higgason 1, C SE SW 8-11n-5e, Madison County, west of a test drilled by Stanolind Oil & Gas Company in Section 10-11n-5e. The new test will go to 6500 feet. Stanolind Oil & Gas Company has placed 3000 acres in the block for the new tests.

Samuel Vierson et al plan an early test in NW SE 23-1n-10e, southwest Jasper County. R. E. Moore has taken a block around Section 12-6n-17e, Lauderdale County, for a proposed test to start by March 15. Sun Oil Company has taken a 10,000-acre block in Townships 11 and 12 north, Ranges 1 east and 1 west, Claiborne County. Exchange Oil Company recently secured by assignment approximate 2200 acres in Townships 1 and 2 south, Ranges 7 and 8 west, George County. The Texas Company added 2000 acres to its holdings in Township 3 north, Range 4 west, Hinds County. W. A. Pritchard is leasing in Township 7 north, Ranges 17 and 18 west, Jeff Davis County.

Southern Natural Gas Company may cooperate with Hassie Hunt in development of a 4000-acre block the latter recently acquired in Township 5 north, Range 4 west, Hinds County, south of Southern Natural Gas Company's block in the same county. The Texas Company is filling in a large block in Township 3 north, Range 12 east, Marion County.

Alabama Test Has Show

W. W. Newman, Trustee, reported a showing of oil and gas in W. P. Nichols 3, SW SE 35-6s-2e, Madison County, Alabama, at 280 feet in the St. Louis-Warsaw formation. Elevation is 602 feet.

Union Producing Company, which drilled a 10,000-foot wildcat test on the Hatchetigbee Anticline in Choctaw County, Alabama, several months ago, in SW SW 20-9n-2w, is reported plan-

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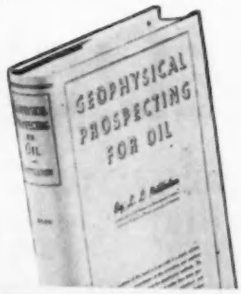

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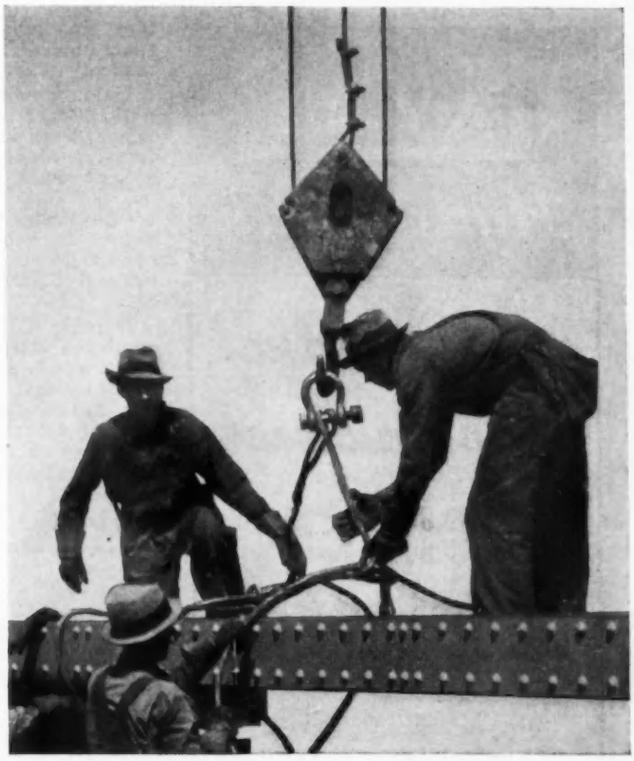

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ning another 10,000-foot test for the same block. The new location has been made tentatively for Section 21-9n-2w.

Union Producing Company took over a 10,000-foot operation at 7520 feet, to which depth it had been drilled by the late Joe Modisette and shut down for several months. Trouble in the hole developed just above 10,000 feet, sidetracking was necessary, and the new hole was never satisfactory. Several companies had spreads in Modisette's original 30,000-acre block around the test.

Humble Oil & Refining Company continued actively to lease in southern Alabama. It secured 9000 acres from R. H. Oswald, located in parts of Baldwin, Clarke and Monroe counties. In Baldwin County, the acreage is mainly in Township 3 north, Ranges 1 and 2 east; in Clarke County, in Townships 3 and 4 north, Ranges 1, 2, 3, 4 and 5 east, and in Monroe County, in Township 9 north, Range 6 east. The company acquired 7600 acres from the First National Bank of Mobile for acreage in Township 3 north, Ranges 3 and 4 east, and also leased 1000 acres in Township 2 north, Range 1 east, Mobile County. Barnsdall Oil Company secured about 1000 acres in Township 3 north, Range 2 east, Mobile County. In Choctaw County, Humble Oil & Refining Company acquired 4000 acres from Hunter-Benn Company in Township 10 north, Ranges 3 and 4 west, and took 20,000 acres from the same company in Townships 6 and 7 north, Ranges 1 east and 1 and 2 west. Greer et al, Shreveport, have leased 1200 acres in Townships 7 and 8, Range 1 east, Clarke County.

In Walker County, Alabama, Amerada Petroleum Corporation secured 12,000 acres from Brilliant Coal Company in Townships 14 and 15 south, Ranges 6, 7 and 8 west. The leases, taken a year ago, have just been recorded.

California

Blowout Enhances Value of Callender at South Rosecrans

A complete reappraisal of production possibilities from the seventh and eighth Callender zones in the South Rosecrans field is in order in the light of performance of Rainbow Petroleum Company's Crawford 21, outpost in Section 20-3-13, Los Angeles County. Blowing out of control when crew was coming out with formation tester, the test ran wild for several hours, flowing an estimated 14,000,000 feet of gas as well as considerable quantities of oil and drilling mud. Some 2400 feet of 2½-inch drill pipe was blown from the hole.

Bottom of hole was at 8543 feet, with water string set at 8315 feet. When brought under control, test flowed 400 barrels daily rate of 42-gravity oil, together with an estimated 7,000,000 to 9,000,000 feet of gas. Flow is from the eighth Callender equivalent. In other wells in this area, showings from the seventh and eighth Callender zones generally have been disappointing.

Pacific Western Oil Corporation has abandoned Meyer 1, outpost in the northwest Wasco area, Kern County, Section 7-27-24, after formation tester showed the well to be wet. Bottomed at 13,150 feet, redrilled from 11,105 feet on a whipstock to a new bottom at 13,135 feet, test of top 9 feet of Rio Bravo sand in redrilled hole recovered only water.

Bolsa Chica Oil Company has abandoned its Coal Oil Point prospect in Section 25-4-25, Santa Barbara County, a tideland permit venture three miles southeast of the Elwood oil field. Taken to 4250 feet, a test is reported to have run into a faulted condition. Over the past 12 years, six tests have been drilled in the immediate vicinity. The company is reportedly giving consideration to further work in the area.

In the Shafter area of Kern County, Continental Oil Company has staked location for a wildcat in Section 35-27-24, KCL A-2. In this same area, Section 12-28-24, the company's Community 1, wildcat, was abandoned early this year after drilling to 13,028 feet and recovering only muddy water with a fair blow of gas on various tests between 12,635 and 12,760 feet.

General Petroleum Corporation has abandoned Erburu 9, northeast outpost in the El Capital area of Santa Barbara County after drilling to 3573 feet. Test was projected for Sespe production.

In Section 5-1-22, Oxnard area, Ventura County, Hawaiian American Exploration Company was preparing to resume drilling on Farrell 1A, wildcat, which has been standing idle at 5100 feet. Drill is in Middle Pico, and operators were seeking principal objective in the Lower Pico and Repetto. Repetto contact is expected between 6000 and 6100 feet.

Trans-Oceanic Petroleum Company has obtained a small producer in the old Santa Barbara Mesa area of Santa Barbara County. M'Divani 6 was drilled in the low property to 1560 feet and completed for 75 barrels daily of low-gravity oil. Location is in the northern section of the field. A second well is to be drilled immediately.

In the Buena Vista Hills district, Honolulu Oil Company has reached 10,822 feet in 25-P, Section 10-22-24, in seeking a new deep zone.

Superior Oil Company's first effort to obtain production from its 80-acre Little lease in Section 27-28-25, Rio Bravo field, Kern County, brought completion of a well flowing 1440 barrels daily of 39.4-gravity oil from 11,470 feet. On the north end of the structure, completion indicates possibility that at least two more productive locations are available on the property.

Revise Payton Pool Rule

A maximum of 40 acres may be assigned to one well for proration purposes in the Payton pool, Pecos and Ward counties, under provisions of a new order issued by the Texas Railroad Commission last week. Under provisions of a previous order, the commission required rectangular units, but under the new rule, the only requirement is that no part of the unit may be more than 1500 feet from the well to which it is assigned.

Operators are required to file unit plats immediately, and the order is effective as of December 15.

UNITED STATES WELL COMPLETIONS

Arkansas

Union County (Rainbow City-Nick Springs)—

Company, Well and Location	Init. Prod. Bbls.	Depth
Fohs Oil Co., Grace 5, 31-17-14	10	3568

Union County (Urbana)—

Marine Oil Co., Union Sawmill Co. A-4, 3-18-13	335	3211

California

Fresno County (Coalinga Northeast)—

Standard, No. 87-19 B	No Est.	8200

Fresno County (East Coalinga Eocene)—

Roberts S. Lytle, No. 66-7F	2444	8015

Kern County (Coles Levee)—

Richfield KCL-A 14-28	139	9553

Kern County (McKittrick)—

Franco Western Oil Co., No. 19	285	2224

Kern County (Rio Bravo)—

Superior, Little 1	1436	11,470
Union, Crites 72-28	844	11,480

Kings County (Kettleman North Dome)—

KNDA, No. 34-20Q	1064	7602

Los Angeles County (Wilmington)—

Leslie Madison, Kern 2	198	3716
Martin-Miller Oil Co., Pet. Management 13	225	3705
Union Pacific, UP-E28	27	3712
Wilton Oil Co., Community 9	No Est.	3712

Orange County (Huntington Beach)—

Signal O. & G. Co., Sig. Bolsa 12-A	600	3872

Santa Barbara County (Santa Barbara Mesa)—

Transoceanic Oil Corp., M'Divani-Lowe 6	25	1548

Ventura County (Rincon)—

CCMO Co., Hobson C-8	69	3600

Ventura County (Ventura Avenue)—

Shell, Edison 36	485	9508
Taylor 127	460	5640
Tide Water, V. L. & W. 38	111	7730

Illinois

Clay County—

Pure, Scrugham Cons. 2, c e½ sw se 4-2n-8e	29	3065

Clinton County—

Crowder, McHenry 1, se nw nw se 2-1n-1w	90	2916
Borton, Storer 1, sw nw ne ne 13-1n-1w	100	4070
P. Mosebach, Maddox 2, nw c ne sw 4-1n-3w	23	1004
Adams O. & G., Copple 26, nw se se sw 35-2n-1w	126	1225
Snell & Boldschmidt, Schaefer 1, sw ne nw 33-2n-3w	4	2535

Coles County—

F. H. Bragassa et al, Trogden 1, c e½ nw ne 11-11n-7e	*	2114

Edwards County—

Noah & Morrison, West Barnes 2, se sw se 13-2s-10e	100	3206

Effingham County—

Ken Kilpatrick et al, Mason Comm. 1, ne se nw 22-6n-5e	451	2502

Fayette County—

Kingwood, Aukamp 1, c sw se 30-5n-3e	*	3570
Riley, Black 1, ne nw sw 25-6n-2e	*	1629
Texas, Maxwell 3, swc ne sw 19-6n-3e	21	1600
Schwarm 1, se ne ne se 30-6n-3e	*	1640
Magnolia, Clow 26, se se ne 5-7n-3e	196	1523
Clow 27, sw se ne 5-7n-3e	227	1557
Clow 7, se se sw 32-8n-3e	900	1542
G. R. Yount, Breeze 1, nwc ne 20-7n-3e	35	1548
Carter, Sickles 3, se ne se 9-8n-3e	14	1592
Wood-Tipsword 1, sw se ne 13-8n-3e	168	1512
Tipsword 1, nw ne nw 24-8n-3e	30	1550
Logue 5, nw ne nw 26-8n-3e	*	1613

Franklin County—

Benedum-Trees, Sheppard-Martin 1, sw ne se 27-7s-4e	385	....

Hamilton County—

Exchange & Kingwood, Prince 1, nw sw nw 31-5s-7e	335	3195
Exchange, Friel 10, sw nw se 34-5s-6e	397	2971
Stelle 2, se nw se 27-5s-6e	208	2964
Abbott 1, se ne sw 27-5s-6e	125	2966
Shell, Porter 1, sw se se 34-5s-6e	240	2953
Porter 3, se se se 34-5s-6e	116	2947
Porter 4, nwc se se 34-5s-6e	192	2959
Texas, Hood 1, ne nw ne 3-6s-6e	200	2955
Edwards 2, ne ne ne 3-6s-6e	222	2947

Marion County—

Shell Oil, Ahlf 3, nw sw ne 18-3n-1e	53	1440

Montgomery County—

H. W. Green et al, Blackburn 1, sw se ne 7-7n-2e	*	2461
Gulf, Moore 1, n½ se se 12-10n-5w	25	1001

Pope County—

Ohio Oil, Gen. Amer. Life 1, ne se se 10-11s-5e	*	1692

Richland County—

Pure, Wachtel 2, c e½ sw nw 7-4n-10e	331	2937

Wabash County—

Ryan Oil Co., Schaffer 1, ne nw ne 7-2s-13w	*	2895
W. W. Gray, Fee 9, swc se 14-3s-14w	40	2880
Fee 10, sw nw se 14-3s-14w	50	2877

Wayne County—

Pure, Miller Cons. 1, c e½ ne nw 8-1n-8e	149	3110
Zimmerman 1, c w½ nw se 25-2n-7e		3135
Stanford Cons. 1 e½ se sw 36-2n-7e	96	3100
Wells Cons. 1, c e½ nw se 29-2n-8e	417	3105
Hosselton 1, c e½ se ne 29-2n-8e	*	3096
Jack Myers, Leininger 1, sw nw nw ne 9-2s-7e	380	3272
Ichenhauser et al, Shreves 1, e½ sw ne 4-3s-8e	*	3569
M.I.O.U. Corp., French 2, w½ se se 4-3s-8e	175	3483

White County—

Herndon Dr., Bond 7, sw se nw 8-4s-14w	*	2875
Tide Water, Evans 2, ne se ne 5-4s-14w	100	2873
Dennis 4, ne sw ne 33-4s-14w	125	2590
Dennis 6, sw ne ne 33-4s-14w	125	2592
Dennis 7, ne se ne 33-4s-14w	335	2735
Magnolia, Bond 6, nw nw se 8-4s-14w	144	2725
Cox 5, sw nw se 27-4s-14w	308	2900
Bond 7, se ne sw 8-4s-14w	75	2735
Superior, Ford 8, sw sw se 27-4s-14w	600	2954
Ford 1, nw sw nw 34-4s-14w	410	2015
Greathouse 1, sw sw ne 4-5s-14w	159	2922
Walter Duncan, Hughes 1, nw ne se 17-4s-14w	171	2716
Kenneth Yost, Bramlett 1, nw nw se 17-4s-14w	173	2722
Ryan Oil, Bramlett 1, ne nw se 17-4s-14w	143	2706
Ben Nation, Dunn 3, ne nw nw 6-4s-8e	108	3251
N. V. Duncan, Henson 1, sw sw ne 23-6s-8e	96	2440
Blackstock, Wilson 2	105	2286
Exchange & Ohio, Pearce 11, nw se ne 11-6s-9e	88	2285
Pearce 10, sw se ne 11-6s-9e	75	2280
Exchange, Holderby 1, se ne ne 11-6s-9e	59	2281

*Failures; †Junked; ¶Million cu. ft. gas.

Summary of Drilling Operations in the United States, Week Ended December 14, 1940

	WELLS COMPLETED							*PERMITS FOR NEW WELLS				
	Completions	Oil Wells	Gas Wells	Failures	Initial Production	Total 1940	Total this Date 1939	This Week	Total this Month	Total 1940	Total this Date 1939	Year Total 1939
Alabama	.....	.....	.....	.....	.....	9	2	.....	.....	.....	.....	.....
Arizona	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....
Arkansas	2	2	.....	.....	345	178	222	6	7	147	221	223
California	17	17	.....	.....	8,412	1,059	1,053	18	40	1,069	1,160	1,174
Colorado	.....	.....	.....	.....	.....	10	19	.....	.....	.....	.....	.....
Florida	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....
Georgia	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....
Illinois*	67	55	.....	12	10,052	3,831¶	3,746	50	161	4,389	802	893
Indiana	7	.....	.....	3	320	507	288	.....	.....	.....	.....	.....
Iowa	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
Kansas	25	17	1	7	21,607	1,914	1,409	38	77	1,981	1,540	1,583
Kentucky	7	4	.....	3	667	357	644	.....	.....	.....	.....	.....
Louisiana	33	23	2	8	5,030	1,648	1,148	33	91	1,635	1,415	1,449
Michigan	20	4	.....	16	380	1,165	1,450	16	38	1,077	1,399	1,419
Mississippi	3	1	.....	2	450	183	18	.....	.....	.....	.....	.....
Missouri	1	.....	1	.....	.....	31	.....	1	1	26	.....	.....
Montana	.....	.....	.....	.....	.....	188	148	.....	.....	.....	.....	.....
Nebraska	1	.....	.....	1	.....	44	1	2	5	66	.....	.....
New Mexico*	6	6	.....	.....	2,906	605	652	9	12	545	282	293
New York†	10	10	.....	.....	20	938	647	.....	.....	.....	.....	.....
North Dakota	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ohio	25	4	17	4	131	1,069	993	.....	.....	.....	.....	.....
Oklahoma	43	26	6	11	4,773	2,061	2,030	30	65	1,810	2,022	2,059
Pennsylvania†	26	16	10	.....	51	3,210	1,524	.....	.....	.....	.....	.....
South Dakota	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
Tennessee	1	.....	.....	1	.....	12	4	.....	.....	.....	.....	.....
Texas	167	128	.....	39	60,700	9,482	9,279	254	365	10,713	10,000	10,269
Utah	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	.....	.....
West Virginia	22	2	14	6	11	616	575	.....	.....	603‡	701	718
Wyoming	.....	.....	.....	.....	.....	150	149	.....	.....	1	.....	.....
Total this week	483	319	51	113	115,855	29,279	26,003	457	862	24,136‡	19,542	20,080
Total last week	520	330	53	137	141,184	28,796	25,412	405	405	23,679‡	18,978	20,080
Total this year	29,279	20,918	1,921	6,440	9,966,139	.....	.....	.....	.....	.....	.....	.....

* This tabulation includes those states where weekly data are available; figures for Illinois date from October 15, 1939; New Mexico from August 1, 1939.
† Includes water-input wells.
‡ Total for West Virginia covers only first 9 months

United States Well Completions—*Continued*

Indiana

Gibson County—
Hall Edwards, Rc., Maier 8, ne sw nw 13-3s-14w 125 2540
Maier 14, se ne nw se 14-3s-14w.. 150 2863
Knox County—
Midwest Dev. Co. et al, Montgomery 1, sw nw sw 12-2n-11w ..... * 1936
W. C. McBride, Metropolitan Life Ins. 2, ne sw sw ne 24-2n-11w... * 1812
Posey County—
J. E. Crosbie, Keck Hrs. 7, se se ne 34-3s-14w 15 2832
Spencer County—
Bowen Hoover, Tr., Bullock 1, ne c sw ne 2-5s-6w 30 1245
Sullivan County—
O. A. Thayer et al, Robbins 1, ne c nw se 8-7n-9w ..... * 647

Kansas

Barton County—
Shell, Homolka 1, nec se 24-16-11w * 3468
Butler County—
Rex-Morris, Sutter 5, ne se ne 7-28-7e 35 2648
Edwards County—
McKnab et al, Minet 1, c sw sw 15-25-17w ..... * 5010
Ellis County—
Wentz, Riddler 2, c n½ sw sw 1-11-18w 173 3529
Darby, Peavy "C" 2, c n½ ne ne 24-11-18w 852 3458
Gulf, Kuhn 1, c n½ se sw 30-13-16w ..... * 3580
Ellsworth County—
Lario, Mehl, c s½ sw se 35-16-10w.3000 3280
Cities Service, Wessler 3, c n½ nw se 19-17-9w 3000 3236
Greenwood County—
Henderson, Schneider 3, ne se sw 9-23-13e 15 1802
Creel et al, Stonebreaker 1, nec sw 32-27-11e ..... * 1305
Kingman County—
Skelly, Miles "G" 1, c ne se 30-27-10w .....¶53.5 4040
McPherson County—
Cities Service, Nyquist 4, c s½ ne nw 19-20-5w 295 3338
Bennett, Knackstedt 3, c n½ sw sw 30-20-5w 240 3356
Rice County—
Continental et al, Root 2, se ne ne 36-18-8w 2850 3239
Rooks County—
Palmer, Denio 1, c e½ sw ne 17-8-16w ..... * 3337
Consumers Coop. Beardmore 4, c n½ sw ne 10-9-16w 3000 3215
Russell County—
Coralena, Phinney 3, c n½ ne ne 30-14-13w 434 2919
Skelly, Ehrlich 2, c n½ nw sw 32-14-13w 559 2964
Rein 7, c s½ nw sw 25-14-14w..1177 3010
Coralena, Meharg 1, se ne se 18-15-13w ..... * 3271
Stafford County—
Helmerich & Payne, Krug 2, c e½ nw sw 2-22-12w 165 3615
Stanolind, Ahnert 1, c w½ se ne 10-22-12w (otd 3635) 472 3639
Bradley et al, Davis 1, c w½ sw sw 32-23-12w ..... * 3987
Shell, Brown 3, ne nw sw 2-24-11w.2340 3752
Cities Service, Neiland "B" 2, sw ne se 16-25-14w 3000 3828
Sumner County—
Stelbar, Knowlton 1, c w½ nw se 6-33-2e ..... * 3836

Kentucky

Christian County—
F. C. Thomas, Worsham 1 ..... * 1001
Daviess County—
Stewart & Snider, Church-Ezell 1.. 142 1287
Hancock County—
Fordsville Oil, Hall 1 ..... * 448
McLean County—
Preston et al, Howell 6 ..... 25 1457
Ohio Oil, Murray 1 ..... 490 1731
J. A. McCowan, Edge 2 ..... 10 650
Snowden & McSweeney, Sutton 1.. * 1469

North Louisiana

Bossier Parish (Wildcat)—
L. K. McGuffin, Tomlinson 1, 16-18n-11w ..... * 1220
Caddo Parish (Rodessa)—
Great Nat. Oil Corp. of La., Means 1, 9-23n-15w .....¶10.0 6067
Caddo Parish (Pine Island-Vivian)—
C. C. Bacheller, Stallcup 3, 34-22n-16w ..... * 2603
Tippett Oil Corp. et al, Browning 3, 22-22n-16w ..... * 2687
Woodley Co., Browning 1, 33-22n-16w 30 2466
Caddo Parish (Pine Island)—
Lloyd A. Farr, Stiles 8, 17-21n-15w 20 1026
J. W. Bailey, Muslow 2, 32-21n-15w 35 1535
E. E. Johnson, Rosenblath 1, 32-21n-15w 37 1533
J. E. Kemp et al, Hobbs 2, 28-21n-15w 40 1525
Pascall Pass, Tyrell 1, 1-20-16w... 60 1512
La Salle Parish (Nebo-Jena)—
H. L. Hunt, Good Pine Lbr. Co. A-6, 9-7n-3e 190 3903
La Salle Parish (Olla)—
Arkansas Fuel Oil Co., Flowers A-1, 12-10n-2e 115 2232
Lizenby Unit B-1, 12-10n-2e..... 15 2232
Placid Oil Co., La. Cent. Lbr. Co. 72, 30-10n-3e 220 2411
La. Cent. Lbr. Co. 51, 1-9n-2e.. 200 2414
Natchitoches Parish (Wildcat)—
Research Dr. Co., Walker 1, 9-10n-10w (second comp) ..... * 3375
Tensas Parish (Wildcat)—
H. V. Schumacher, Mounds Plantation 4, 39-11n-12e ..... * 3002
Union Parish (Monroe)—
Carbons Cons, Haile 1, 16-21n-3e..¶7.0 2200

South Louisiana

Anse La Butte—
Stanolind, Bergson 2 ..... 240 4725
Charenton—
Pan American, South Coast 8.... * 2807
Darrow—
Humble, Community 31 ..... 355 4686
East Tepetate—
H. L. Carnahan, McManus 1-B.... 150 3525
Golden Meadows—
Brown-Woods, Cheramie 1 ..... 319 5225
North Crowley—
Humble, Rainers 4 ..... 720 8805
New Iberia—
Helis, Bullock 4-A 680 6625
Paradis—
Texas, LL&E-Paradis 7 ..... 555 10,432
Sulphur—
Union Sulphur, Fee 873 ..... 224 6350
University—
Superior, Hatfield Comm. 1..... 172 7246
Ville Platte—
Continental, Hirsch 6 ..... 99 10,180
West Hackberry—
Stanolind, State Land 57 ..... 378 9755
Woodlawn—
Union Sulphur, Romero 1 ..... 176 9571
Cameron Parish—
Superior, State-Lake Calcasieu 4.. * 8664
Terrebonne Parish—
Stanolind, State-Bay Junop 1..... * 11,002

Michigan

Allegan County—
Keyson Oil Co., Steele 1, ne nw ne 6-1n-11w ..... * 1604
Paul R. Hardy, Bridgeman 1, ne se nw 29-1n-13w 250 1375
Arenac County—
D. J. Shiffman, Crawford 1, se se ne 17-19n-3e ..... * 2960
Pure Oil, Ostrosky 1, nw ne se 22-19n-3e ..... * 3003
Gratiot County—
Chartiers Oil Co., Wagner 1, ne ne sw 2-9n-4w ..... * 3215
Huron County—
Cryden Pet. Corp., Sommers 1, nw sw nw 21-17n-14e ..... * 1456
Isabella County—
W. E. Ross, Wodren 1, nw se ne 8-16n-3w ..... * 1300
Kent County—
William Clock, Kniff 1, sw ne se 29-7n-12w 100 1920
Missaukee County—
Rowmor & Ohio, State 43, c s½ sw sw 16-21n-6w ..... * 3927
Monroe County—
Capehart & Merchant, Sphr 1, nw nw nw 29-6s-6e ..... * 2152
Montcalm County—
C. M. Carother, Rice 1, c n½ sw sw 21-10n-5w ..... * 3236
Ogemaw County—
Gulf, Garber 1, c w½ sw sw 8-24n-1e ..... * 3018
Weber Oil Co., Estey 4, ne ne sw 28-22n-2e 25 2687
Otsego County—
Rinehart & Hickok, AuSable 1, nw se nw 34-30n-3w ..... * 2488
Shiawassee County—
Fisher-McCall Oil Co., Placeway 1, sw se nw 25-5n-2e ..... * 1915
Van Buren County—
W. R. Borough, Inc., Wait 1, sw sw se 10-1s-14w ..... * 1335
Frank Gouin, Grant 1, nw se ne 15-1s-14w ..... * 1258
Clapsaddle & Harris, Draheim 1, ne se ne 16-1s-14w ..... * 1295
Miller Bros., Landrus 1, sw nw nw 11-1s-15w 5 1191
Allegan Pipe & Supply, Reynolds 1, nw nw sw 16-1s-15w ..... * 1189

Mississippi

Hinds County (Wildcat)—
Sanford & Sellars, Sellars 1, 13-22n-2e ..... * 602
Yazoo County (Wildcat)—
Arcarea Reserve Co., Holmes 1, 22-12n-1e ..... * 5918
Yazoo County (Tinsley Dome)—
Union Prod. Co., Childers 6, 19-10n-2w 450 4924

Missouri

Clay County—
Hall et al, Pryor 1, c se sw 35-52n-32w (pb 447½) .....¶0.16 481

Nebraska

Richardson County—
Forest City Basin Synd, Windle-Dodge 1, se ne se 3-1n-15e ..... * 2605

New Mexico

Lea County (Arrowhead)—
Ohio Oil, State-McDonald 20, ne se se 13-22s-36e 1120 3750
Lea County (Eunice)—
T. P. Coal & Oil Co., State 22-A, c e½ se sw 7-22s-36e 480 3838
Lea County (Lynn)—
Brewer Dr. Co., Whitten 1, ne nw se 33-22s-36e 35 3652
Lea County (Maljamar)—
Carper Dr. Co., Simon 1-B, c nw ne 30-17s-32e 712 3712
Lea County (Mattix)—
Trinity Dr. Co., Mattix 3-B, c sw se 10-24s-37e 15 3537
Lea County (Vacuum)—
Texas Co., State 2-AC, c nw se 2-18s-34e 544 4710

New York

ALLEGANY COUNTY

Vosburg Oil Co., Green farm, Genesee 5 1325
C. H. Christman & Son, Underwood farm, Scio 6 1460
Albert Oil Co., Easton farm, Alma 6 1410
Sloan & Zook, McDivitt farm, Bolivar 3 1374
Water Intake Wells—
Trio Oil Co., Durham farm, Bolivar ... 1376
Messer Oil Co., Miles farm, Bolivar ... 1436
Bradley Prod. Corp., Lewis farm, Alma 1567
Marsh Oil Co., Fay farm, Bolivar.. ... 1380
L. H. Richardson et al, Browning-Wright farm, Scio 960
P. H. Fuller Est., Fuller farm, Amity 853

Ohio

Ashland County—
Ohio Fuel, Gantz 1 .....¶2.0 2500
Athens County—
Townsend, Carsey 2 .....¶0.06 1680
Carpenter et al, Smith 30 ..... * 336
Fairfield County—
City Nat. Gas, Conrad 2 ..... * 482
Guernsey County—
Ronshausen, Ford 2 ..... 1 1085
Holmes County—
Ohio Fuel Gas, Yoder 1 .....¶0.36 4201
Starner 1 .....¶0.09 3332
Jefferson County—
John M. Elliott Oil Co., Andrew 1 2 460
Lawrence County—
Star Gas, Templeton 1 .....¶0.1 2850
Licking County—
Everett Co., Mound Mort. Loan Co. 1 .....¶0.55 2403
Alex Willey et al, Holtz 1 .....¶0.45 2578
Weiss 1 ..... * 2656
Ohio Fuel Gas, Watkins 2 .....¶0.15 2357
Glover 1 .....¶0.1 2675
Lorain County—
Wiser, Bachellor 1 .....¶1.5 2451
Ohio Fuel Gas, Wise 1 .....¶0.06 2647
Meigs County—
Proffitt et al, Wells 1 .....¶0.13 1980
B. M. Tyree et al, Karr 1.....¶0.02 3026
Monroe County—
Paulus et al, Ullman 1 .....¶0.05 1993
Muskingum County—
Ohio Fuel Gas, McClaughlin 1 ....¶4.12 4011
Ford 1 .....¶0.35 3440
Noble County—
Metcalf, Springer 7 ..... 3 1061
Perry County—
Palm Oil, New Perry Coal 1 ..... 125 3380
Preston Oil Co., Love 1 .....¶0.34 2805
Vinton County—
Kelch Bros., Searest 1 ..... * 1688

United States Well Completions—*Continued*

Oklahoma

Company, Well and Location	Init. Prod. Bbls.	Depth
Bryan County—		
Pure, Little (106) 1, swc 27-5s-7e..	480	5080
Carter County—		
Magnolia, Richards 82, cwl swc se 31-3s-3w	65	1128
Porterfield et al, Walker-Voorhees 2, se sw se 17-4s-2w	125	2219
Daube et al, Woodruff 1, nw ne ne 18-4s-2w	*	2501
Gibson et al, Griffin 3, se ne se se 20-4s-2w	225	2145
Kerbo et al, McKey 2, csl ne sw sw 20-4s-2w	*	2157
Turner, Stearns 4, c sw sw 21-4s-2w	200	2272
Ward 3, ne nwc 28-4s-2w	150	2346
Lamb, Fee 2, cwl nwc ne 20-4s-2w	50	2325
Creek County—		
Beal, Lampkin 1, se sw se 25-14-9e	*	2026
Whitecotton, Tiger 1-A, c s½ se sw 9-14n-10e	*	3344
Sinclair Prairie, Kiefer 13, sw sw nw se 17-17n-12e (otd 1491)	5	1510
Jackson County—		
Altus Pet., Minor 3, se sw ne 15-1n-20w	57	1562
Doss et al, Robertson 1, ne nw se 15-1n-20w	29	1534
Lincoln County—		
Buell et al, Thomas 2, c e½ se sw 10-13n-6e	¶33.1	4134
McIntosh County—		
Pine, Fuller 1, sw nw se nw 13-11n-16e	¶1.0	2407
Muskogee County—		
Haskell Gas. Co., Corbray 1, swc ne 1-15n-15e	1.3	302
Okfuskee County—		
Burke-Greis, Scott 1, c nw se 20-10n-10e	*	3745
Shell, Dunn 1, nws 36-11n-8e	8	3435
Droppleman, Dill "C" 4, sec ne 34-12n-8e	960	3680
Oklahoma County—		
Phillips, Guss 1, sw ne se sw 27-12n-3w	345	6610
Tower, Military "A" 5, nw se ne sw 34-12n-3w	502	6534
Okmulgee County—		
Penrod, Love 1-B, ne nwc 12-14n-12e	8	2718
Wallace, Rentie 3, c e½ sw sw 11-14-14e	*	1060
Hill, Smith 3, nw nw sw se 9-15n-14e	*	1935
Osage County—		
Barnsdall, Waterflood 1, se nw sw ne 31-21n-9e	w inp	342
Texas & Lewis et al, St. John 2, c n½ se sw 17-24n-7e	143	2636
I.T.I.O., 23, ne ne se se 22-25n-11e..	¶0.8	1918
Pawnee County—		
Platter, Bunch 3, ne nw sw sw 4-20n-9e (pb 675)	¶0.17	2760
Payne County—		
Texas, Graham 4, c e½ se sw 12-17-1e	60	4940
Pottawatomie County—		
Patterson, Edwards 2, nw nw se se 28-6n-5e	27	2760
Transwestern, Latimer 3, swc nw 16-7n-4e (otd 4128)	12	4195
H. Phillips, Bettis 5, ne sw sw 21-7n-4e	840	4279
Maebris, Brown 2, nw sw nw 33-7n-4e (otd 4195)	432	4252
Seminole County—		
Hall et al, White 3, nwc se 30-6n 8e	*	2621
Phillips, Tewee 5, ne nw se 14-7n-6e (pb 3232)	*	4276
Oklahoma, Butler 2, sw se ne 35-9n-6e (pb 3600)	*	4432
Stephens County—		
Winkler, Winters 1-A sw se se 10-1s-8w	*	2986
C. Carter, Simms 20, nw sw se 13-13-2s-4w	3	342
Stogner, Bush 1, ne nec sw 3-2s-8w	20	1540
Pace, Miller 1, nw ne nw 13-3s-5w (pb 952)	12	2741
Wagoner County—		
Goble, McGee 2, nec se 34-18n-15e..	15	1121
Bear, Henry 1, se ne ne 20-19n-16e.	¶2.0	1197

Pennsylvania

BRADFORD DISTRICT

Tapp, Gallets & Buffington, Trs. Fee	7	....
Matthew Lippert et al, Lippert	5	....
Messer Oil Corp., Loop	1½	....
Bell & Loop, Hoffman	½	....
Pine Run Oil Co., 130-1-2-3-4-6 Bing 3	5	....
Forest Oil Corp.	1	....
Forest Pet. Corp.	1	....
Niagara Oil Corp., 5 wells	5	....
Bradford Tr. Co., 17 wells	17	....
Water Intake Wells—		
D. E. Quinlan Est., Fee	...	....
Forest Oil Corp.	...	....

NEW YORK-PENN GAS FIELD

Penn York Gas Co., S. Nixon	¶	....
Cunningham Natural Gas Co., P. Luden	¶	....

MIDDLE DISTRICT

United Nat. Gas Co., Beck	¶	....
Venango Oil & Land Co., Lower Reno	½	....
C. S. Ehret, Stull	5/12	....
Underwood Moody & Co., Loop	3	....
Bellview Oil Co., Lot 531	1	....

BUTLER-ARMSTRONG DISTRICT

G. W. Eaglesfield, Fee	1	....

SOUTHWEST DISTRICT

Armstrong County—		
Shaw & Towsend, Zitterberg 1	¶0.35	3504
Dan Sowers, Rupp 2	¶	1500
Fayette County—		
Wahler-Powers, McKeefry Coal 1	¶0.8	1433
Greensboro Gas Co., Mozo 1	¶0.6	2400
Greene County—		
Equitable Gas Co., Kerr 1	¶0.14	3685
Mayne et al, Stephenson 1	¶0.12	1462
Westmoreland County—		
Peoples Nat. Gas, George 1	¶0.08 -	3200

Tennessee

Clay County—		
Overstreet & Sparks, Cherry 1	*	754

South Texas

CORPUS CHRISTI DISTRICT

Bee County (Wildcat)—		
Magnolia, Page Bros. 1, W. T. Evans sur	*	3960
Brooks County (Kelsey)—		
Humble, McGill Bros. 73	400	4732
Brooks County (Wildcat)—		
West Prod. Co., Ehlers 1, Loma Blanca gr.	*	8824
Jackson County (Ganado)—		
Texas Co., Mauritz et al 3-A	150	5103
Jackson County (Lolita)—		
Barnsdall, Lazarus 5	500	5931
Humble, L. Ranch Co. 3-B	1200	5932
Magnolia, Ward 7	500	5283
Wesson 1	600	5931
Jackson County (West Ranch)—		
Magnolia, Turner 5	1100	5768
Jim Wells County (Ben Bolt)—		
Bridwell Oil Co., Smith 5	*	5480
Jim Wells County (East Alice)—		
Tom Graham Co., Cook 1	¶10.0 & 100	5180
Jim Wells County (Orange Grove)—		
Frank Buttram, Einiegl 1	*	5103
Tide Water, Natho 3	*	5116
Live Oak County (Wildcats)—		
Henderson Coquat, McLean 1, Oakville area	*	3596
Danciger, San Antonio Joint Stock & Land Bank 1, Thomas Henry sur	*	1801
Nueces County (Bentonville-King)—		
Southern Minerals Corp., King 16-B	400	5664
Nueces County (Minnie Bock)—		
Sun Oil, Robertson 1	75	3825
Nueces County (South Clara Driscoll)—		
Magnolia, Johnson 6	450	5120
Texas Conservative Oil Co., Flinn 9-B	400	5288
Nueces County (Stratton)—		
Baytex Oil Corp., Union Central 3..	650	6794
Navarro Oil Co., Sellers 1	500	6588
Refugio County (Tomoconnor)—		
Quintana Petr. Corp., Williams 16-A	1000	5925
San Patricio County (Wildcat)—		
Henderson Coquat & Wilcox O. & G. Co., Menger 1, Sec. 11	*	6004
Victoria County (Talferner)—		
Sunray Oil Co. & Colton & Colton, Fimble 2	*	2715
Victoria County (Victoria)—		
Magnolia, Simon 4	112	3060

LAREDO DISTRICT

Duval County (Cedro Hill)—		
Magnolia, D.C.R.C. 18 (132)	25	1460
Duval County (Cole-Bruni)—		
Magnolia, Benavides 1 (owdd fr 2365)	*	3170
Duval County (Lundell)—		
Magnolia, D.C.R.C. 20 (58)	*	1758
Duval County (Tesoro)—		
R. J. Grant et al, Cuellar Bros. 1..	*	5775
Duval County (Driscoll)—		
Continental Oil, Driscoll, Jr. Est. 59-A	500	3305
Duval County (Wildcat)—		
Robert Coker, Smith-Corkill Est. 1, e½ sur 490	*	3521
Jim Hogg County (Colorado)—		
C. Andrade III, Martinez (Trevino) 4-D	400	2946
V. F. Neuhaus, Martinez (Trevino) 3-C	500	3005
Humble, Allen 1	100	2662
Jim Hogg County (Wildcat)—		
Jay Simmons & V. G. Schimmel, Gutierrez 1-A, sur 144	*	3615
Starr County (Boyle)—		
Borsodi Petr. Co., Chapa de Vela 3	100	3750
Starr County (Sun)—		
Sun Oil, Montalvo 6-A	500	4880
Webb County (Wildcat)—		
Edwards & Boyd, Laurel Bros. 1, sur 717	*	2656
Zapata County (Escobas)—		
Dulup Oil Co., de Garcia 1-C	8	1041
de Garcia 2-C	7	1045
Zapata County (Glen)—		
Transwestern Oil Co., Yaeger-Strohman 1-B	150	2177
Zapata County (Wildcat)—		
Neilson & Palmer, Maryland Trust Co. 1, sur 314	*	2311

SAN ANTONIO DISTRICT

Bastrop County (Cedar Creek)—		
Marts & Beaven, Austin Nat. Bank 1	107	2174
Caldwell County (Luling)—		
Murchison, Closuit & Reed, Jennings 4-B	40	2100
Caldwell County (Dale-Bee Creek)—		
Ralph R. Ogden, Miears 7	*	2245
Guadalupe County (Darst Creek)—		
Ellmag Oil Corp., Appling 4	150	2554

Texas Gulf Coast

Anahuac—		
Humble, Boyt 4	480	7078
Broussard-Hebert 9	660	7231
Esperson—		
General Crude, Zaruba 1	760	7129
Fairbanks—		
Stanolind, Jahnke 10	142	6840
Fannett—		
Gulf, Marrs McLean 3-E	820	8340
Hastings—		
Hastings Oil, Alexander 2	635	6122
Humble—		
Texas, Kroehler 42	*	3660
LaBelle—		
Sun, Broussard-Hebert 8	264	5552
Magnet—		
Humble, Cockburn 29	88	5541
Old Ocean—		
Stanolind, BRLD 1	491	11,031
Red Fish Reef—		
Humble, State 3-A-248	156	10,419
Rowan—		
Humble, Hubbard 2	170	8541
West Columbia—		
Texas, Hogg 97	166	3221
Withers—		
Pan American, Halamicek 5	51	8546
Texas, Pierce B-65	114	5547
Pierce B-66	110	5378
Pierce C-85	112	5375
Pierce C-86	130	5377
Fayette County—		
O. C. Garvey, Meyer 1, Fayetteville	*	5865
Matagorda County—		
Ohio, Blackburn 1, Sugar Valley	*	9506

West Texas

Cochran County (Duggan)—		
Devonian et al, Duggan 3-C-10	261	5051
Osage Dr. Co., Moore-Devonian 1-E	279	5068
Crane County (Jordan)—		
Texas Co., University 6-D	3813	3559
Crockett County (Todd Deep)—		
Continental et al, Todd 6-B	258	5928
Ector County (Foster)—		
Sinclair Prairie, Johnson 4-B	1456	4144
Skelly Oil, Addis 2	952	4140
Sunray Oil, Johnson-Landreth 2-E.	654	4240
Ector County (Goldsmith)—		
Gulf, Goldsmith 322	135	4223
Ector County (North Cowden)—		
Barnsdall, Smith 20	1169	4370
Rhodes-Tompkins et al, T. P. Land Trust 3	428	4200
Texas Co., Holt 4	324	4457
Ector County (Wildcat)—		
Forest Dev. Corp., Bradley 1	77	4410
Gaines County (Seminole)—		
Amerada, Turlin-Gill 2	607	5285
Gaines County (Wasson)—		
Continental Oil, Wasson 7-48	†	4850
Wasson 8-48	861	5030
Hockley County (Slaughter)—		
Bass & Dillard, Heffner-Forehand 1	817	4980
Texas Co., Slaughter 12	806	4985
Pecos County (Lehn)—		
C. Campbell et al, Lehn-Texaco 3..	141	1711
Pecos County (Wildcat)—		
Davis & White, Fromme 1	120	1888
Upton County (Gulf-McElroy)—		
Gulf, McElroy 232	2374	2868
Crier-McElroy 46	1378	2824
Ward County—		
Gulf, Estes 140	1724	2688
Ward County (Wildcat)—		
Sinclair Prairie, Davis 1	*	3864
Winkler County (Keystone)—		
Gulf, Keystone 39	729	3475
Yonkum County (Wasson)—		
Aloco Oil Co., Keller-Texaco 9	516	5201
Don Danvers et al, Willard 7	949	5250
Humble, Bennett 11	809	5270

United States Well Completions—*Continued*

North Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Archer County (Griffin)—		
Jack Kadane et al, Griffin 1	1470	4339
Archer County—		
L. T. Burns et al, Wilson-McCrory-Shell 1	17	1473
Cochran & Cain, Little 12-B	14	1384
B. L. Ligon et al, Little 9-B	8	1363
Young & Woody, Meade 1-B	86	958
Baylor County (Wildcat)—		
British-American O.P. Co., Turbeville 1	806	2522
Clay County—		
Akin-Dimock & Costley, Ramsey 1	29	1314
L. T. Burns et al, Hamilton 6	*	287
Gilchrist & Boswell, Hamilton 2	*	275
C. Y. Gorman et al, Taylor 13	10	1143
Sussex Oil Corp., Glasgow 17	7	180
Cooke County—		
Bridwell Oil Co., Flusche 8-B	9	802
Flusche 9-B	47	810
Kewanee Oil Co., Hayman-Lanier 13-B	10	1527
Kingery Bros. et al, Trubenbach 2	222	1322
W. H. Metzner et al, Eberhart 1	*	830
Cooke County (Walnut Bend)—		
Sinclair Prairie, Ramsey 3	778	4758
Jack County—		
Nelson Oil Synd, Bridwell 2	49	3028
Paul Steel et al, Derrick 1	320	3105
Montague County—		
Continental Oil, Hynd 4 (dd from 920 ft)	*	2137
Montague County (Benton-Holmes)—		
Texas Co., Custers 1	280	3712
Throckmorton County—		
W. Neustadt et al, McKeichan 2	6	432
A. L. Watson et al, Odell 1-A	12	395
Wichita County (K-M-A)—		
S. H. Fagadau et al, Potts 2	*	4127
Fain-McGaha Oil Corp., Griffin 6-C	840	3787
Hanlon & Buchanan, Burnett 1-A	392	4146
Shell Oil & Phillips, Griffin 14	996	3836
Wichita County—		
Oscar Kemp et al, Heiserman 1	25	1358
Magnolia, Reilly 161	*	1445
Staley Oil Co., Glass 2	27	1319
Wilbarger County (Consolidated)—		
Consolidated Oil, Ancell 5-J	255	4013
Young County (Wildcat)—		
W. R. Stafford et al, Hamilton 1	*	807
Young County—		
J. T. Harrell et al, Rogers 4	140	891
Rogers 5	208	900
R. H. Larsen et al, Kirkland 1	*	602
Carl Wainwright et al, Rogers 2	102	899

Texas Panhandle

Company, Well and Location	Init. Prod. Bbls.	Depth
Carson County—		
Cities Service, Magnolia 4-F	194	3120
Gray County—		
Cree & Hoover, Davidson 1-A	20	3037
S. C. Evans et al, Benton 7	58	3300
Texas Co., Williams 25	154	2918
Wilcox O&G Co., Combs-Worley 44	38	3280
Hutchinson County—		
Gulf, Whittenburg 9-B	119	3031
J. M. Huber Corp., Riley 1	288	3255
Kewanee Oil Co., Lewis 49	261	3000
McIlroy Oil Co., Tomlinson 2	135	3275
Shell, Harvey Sisters 3-B	417	3050
Skelly, Watkins 8-B	264	2870
Texas Co., Quinn 17	301	3175
Travelers Oil Co., Gaile 14-B	594	3065

West Central Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Brown County—		
M. R. Hart et al, Teague 1	*	1271
Callahan County (Wildcat)—		
N. D. Gallagher et al, Grissom 1	*	1775
Coleman County—		
J. C. Ort et al, Walker 1	33	1922
Coleman County (Wildcat)—		
States Oil Corp., Morris 1-B	*	4375
Eastland County—		
F. Kirk et al, Gilmore 1	70	2787
Jones County (Wildcat)—		
T. D. Humphrey et al, Lipham 1	*	2751
Jones County—		
J. C. Hunter et al, Minter 1	*	2521
Ungren-Frazier et al, Akard 1-A	177	2135
Stephens County—		
Swadmo Oil Co., McCauley 1	10	3562
Tarrant County (Wildcat)—		
J. M. Hickey et al, Baltzell 1	†	935
Taylor County—		
Eastland Oil Co. et al, Bigham 1	*	2935
S. & B. Oil Co., Fain 2	254	2392

East Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Kilgore Area—		
Hamill & Smith, Griffin 2, blk 120	1200	3570
Overton Ref. Co., I&GN Co. 21-B (7.88-ac)	960	3565
Sinclair Prairie, King 27-B, Tr. 5 (147-ac)	2500	3472
L. L. Sugar et al, Griffin 5 (1.6-ac)	1220	3561
H. L. Swindler et al, Mayfield 8	500	3728
Longview Area—		
Joe Long Dr.-Cushing Dr. Co., Owens 11-C (72-ac)	900	3656
Peyton Bros. et al, Jones 4 (2½-ac)	4000	3586
B. F. Phillips, Jr. & Lange, Sprouse 1	600	3700
Anderson County (Wildcat)—		
Tex-Harvey Oil Co., Cartmel 1	*	5533
Anderson County (Long Lake)—		
Tide Water-Seaboard, Evans 1 (dual well)	¶115.0 & 28	5313
Franklin County (Talco)—		
Talco Asphalt & Ref. Co., Rutherford-Gulf 2	428	4295
Freestone County (Cayuga)—		
Stanolind, Cullinan 5	102	4025
Navarro County (Wildcat)—		
Coffield & Guthrie, Hines 1-A	*	2906

West Virginia

Company, Well and Location	Init. Prod. Bbls.	Depth
Boone County—		
Sayre O. & G., Hill 1	¶0.07	3329
Owens-Libby-Owens, Cassingham 1	¶0.06	2117
Braxton County—		
Joe Rubin, Sands 1	*	2062
Cameron Prod. Co., Hamrie 1	*	1995
Calhoun County—		
V. W. Hamilton et al, Cunningham 3	10	2209
Hope Nat. Gas, Fowler 8519	¶0.27	2190
Minney 8522	¶0.17	1963
Clay County—		
Pitts. & W. Va., Boggs 7761	¶1.05	1839
Joe Rubin, Adena Corp. 2	*	2225
Gilmer County—		
Carnegie Nat. Gas, Miller 4	¶0.24	944
Showalter 1	¶0.04	1731
Pitts. & W. Va. Gas, Rinehart 7551	*	2055
Jackson County—		
W. Va. Gas, Huffman 1	¶7.5	5175
Columbia Carbon, Anderson 461	¶2.0	5115
Kanawha County—		
Godfrey L. Cabot, Putnam Co. 12	¶6.8	5248
United Carbon, Wines 1	¶1.4	5051
Mingo County—		
McKinley Trent, Tr., Stepp 3	¶0.3	3365
Pleasants County—		
A. F. Marple, Fee 3	I	830
F. R. Ball et al, Fleming 1	*	2050
Ritchie County—		
F. S. Deem, Stephenson 6	*	1980
Upsher County—		
Pitts. & W. Va., Munson 7766	¶0.04	4658
Wayne County—		
Hale & Burgess, Brumfield 1	¶0.32	2884

*Failures; †Junked; ¶Million cu. ft. gas.

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Ask Increase for South Esperson, Liberty County

General Crude Oil Company has requested an increase of 2000 barrels daily in the allowable for South Esperson field, Liberty County. At a hearing before the Texas Railroad Commission last week, Thomas W. Pew, company vice president, said there are 17 wells in the field, and two tests drilling.

Production comes from sands found between 6600 and 7800 feet, and the additional oil can be produced without physical waste, Pew said. The allowable has been cut from 87 barrels in September to 47 barrels in December, and currently averages about two barrels per acre per day. Pew estimated that 70 years would be required to deplete the reservoir at the present rate of production.

Sun Oil Company has agreed to buy the oil.

Joaquin Hearing Postponed

The Texas Railroad Commission has postponed indefinitely its hearing on the Joaquin field, Shelby County, scheduled for December 12. Applicants asked for further time to prepare data.

WILDCAT REPORT
New Starts and Completions

CALIFORNIA
FIRST REPORTS

Kern County—Continental's KCL C-2, sec 35-27-24, lcn, Shafter area.

Ventura County—Palma Oil Co.'s Elkins 1, sec 8-3-19, lcn, Bardsdale area.

KANSAS
FIRST REPORTS

Chautauqua County—Aladdin et al's Westerfield 1, ne sw nw 3-32-8e, pts.

Greenwood County—Seaney et al's Tollman 1, nec 15-28-11e, lcn.

Rooks County—Helmerich & Payne et al's Baumgarten 1, c e½ se nw 25-9-19w, dr.

Russell County—Cities Service's Steinle 1, ne sw nw 36-14-12w, dr.

COMPLETIONS

Barber County—Barbara O.&G. Co.'s Angell "A" 1, c ne se 10-33-14w, 7 mi w Medicine Lodge pool, Mississippi 4680 ft, Base Mississippi 4981 ft, Misener 5048-58 ft, Viola 5058 ft, so 5048-69 ft, 150 ft oil at 5078 ft, 6000 gal acid, no increase, est 8 bbls per day, bad hole 5121-31 ft, Simpson sd 5188 ft, Basal sd 5212 ft, Arbuckle 5290-91 ft, hfw, pb 5062 ft, 40 qts 5047-58 ft, shut in 36 hours, 3 bbls oil, pb 4788 ft, shot 30 qts 4764-86 ft, abnd 5291 ft.

Douglas County—Forrester et al's Alterbrand 1, csl nw 35-12-20e, 4 mi e Lawrence, Mississippi 1105-1507 ft, Hunton 1564 ft, abnd 1650 ft. Douglas County O.&G. Syndicate et al's Gage 2, nec se 11-13-20e, 7 mi n Baldwin pool, Mississippi 1102-20 ft, pb 685 ft, little gas, abnd 1120 ft. Forrester et al's Ice 1, sw se se 9-14-19e, 6 mi sw Lawrence, Squirrel 930 ft, some gas, abnd 940 ft.

McPherson County—Williams et al's Henne 1, swc ne 21-17-1w, E. Roxbury disc, Mississippi 2648 ft, pay 2658-61 ft, td 2661½ ft, 2000 gals acid, pump 495 bbls, 36-gr.

Osage County—Edwards et al's Detrich 1, c nw se 21-14-15e, 5 mi n Osage City, otd 1650 ft, Mississippi 1904 ft, abnd 2200 ft.

NORTH LOUISIANA
FIRST REPORT

La Salle Parish—Harry Shulman's Whiddon 1, sw ne 9-9n-3e, rig.

COMPLETIONS

Bossier Parish—L. K. McGuffin's Tomlinson 1, sw ne 16-18n-11w, abnd 1220 ft.

Natchitoches Parish—Research Dr. Co.'s Walker 1, ne ne 9-10-10w, abnd 3375 ft, (workover, original test dr by Jack Lent).

Tensas Parish—H. V. Schumacher's Mounds Plantation 4, sec 39-11n-12e, abnd 3002 ft.

SOUTH LOUISIANA
FIRST REPORT

Plaquemines Parish—Phillips' State 1, sec 48-20s-29e, ne Venice fld, w of Mississippi, lcn.

COMPLETIONS

Acadia Parish—H. L. Carnahan's McManus 1-B, sec 21-7s-1w, first oil sd East Tepetate fld, flwg 150 bbl 26-ga dly via ¼-in ch from 3515 ft, tbg pressure 220 lbs.

Cameron Parish — Superior's State-Lake Calcasieu 4, in lake, sec 1-14s-9w, dld 7968 ft in salt, top 7845 ft, pb 6400 ft, sidetracked 7367 ft, pb 6540 ft, sidetracked 8664 ft, abnd.

Terrebonne Parish—Stanolind's State 1-200, Bay Junop, sec 35-21s-14e, dld 11,002 ft, pb, sidetracked 9351 ft, set 7-in 8381 ft, abnd.

MISSISSIPPI
FIRST REPORT

Madison County—C. L. Higgason et al's Higgason 1, c se sw 8-11n-5e, rig for 6500-ft test.

COMPLETIONS

Hinds County—D. H. Sanford & Robt. Sellars; Sellars 1, sec 13-22n-2e, abnd 602 ft.

Yazoo County — Arcarea Reserve Co.'s Holmes 1, se 22-12n-1e, elev 305 ft, Cane River 1160 ft, Tallahatta 1286 ft, Wilcox 1633 ft, Midway 3644 ft, Clanton 4502 ft, Selma chalk 4565 ft, Eutaw 5444 ft, first Eutaw sand 5503-26 ft, abnd 5918 ft in Eutaw.

MICHIGAN
FIRST REPORTS

Allegan County — McClanahan Oil Co.'s Funk 1, sw nw sw 28-4n-12w, dr. Charles W. Cook's Blakeslee 1, se ne se 24-3n-14w, rig. Bridger Basin Oil Corp.'s Harden 1, sw ne se 7-2n-11w, dr.

Isabella County—Belvidere Oil Co.'s Erskin 1, nw sw se 22-13n-5w, dr.

Mason County—Merrill & Dean's Young 1, se nw sw 9-17n-15w, rig.

Van Buren County — Smith Pet. Co.'s Northrup 1, nw nw sw 7-3e-15w, dr.

COMPLETIONS

Allegan County—Keyson Oil Co.'s Steele 1, ne nw ne 6-1n-11w, Traverse 1552 ft, td 1604 ft, abnd.

Gratiot County—Chartiers Oil Co.'s Wagner 1, ne ne sw 2-9n-4w, Dundee 3182 ft, abnd 3215 ft.

Huron County—Cryden Pet. Co.'s Sommers 1, nw sw nw 21-17n-14e, Traverse 1434 ft, abnd 1456 ft.

Missaukee County—Rowmor & Ohio's State 43, c s½ sw sw 16-21n-6w, Dundee 3921 ft, abnd 3927 ft.

Montcalm County—C. M. Carother's Rice 1, c n sw sw 21-10n-5w, Dundee 3199 ft, abnd 3236 ft.

Ogemaw County—Gulf Ref. Co.'s Garber 1, c w sw sw 8-24n-1e, Dundee 2909 ft, abnd 3018 ft.

Otsego County — Rinehart & Hickok's AuSable 1, nw se nw 34-30n-3w, abnd 2488 ft.

Shiawassee County — Fisher-McCall Co.'s Placeway 1, sw se nw 25-5n-2e, abnd 1915 ft.

NEW MEXICO
FIRST REPORT

Chaves County—L. E. Elliott et al's State 1, c nw ne 16-11s-31e, mim. Roxana Oil Co.'s Maull 1, sw ne nw 11-12s-25e, sd for cas 300 ft.

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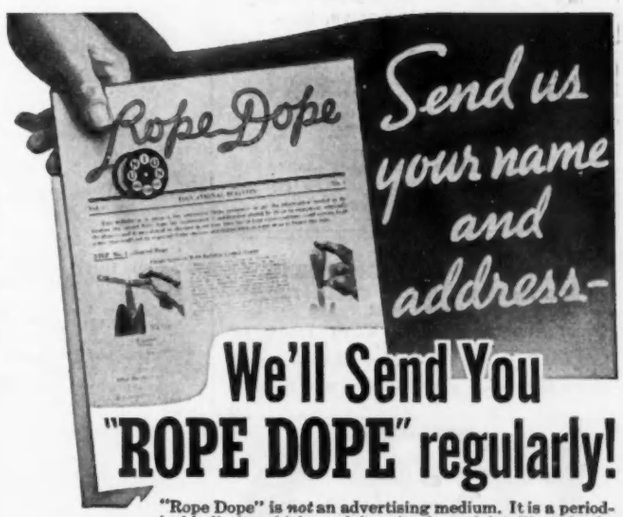

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NEBRASKA

FIRST REPORTS

Richardson County—Johnson & Mitchell et al's Burgner 1, ne se ne 31-1n-16e, lcn. Midland Dev. Co.'s Fehr 1, c nw se 31-2n-16e, rur.

Sarpy County—L. H. Hough et al's Timm 1, c s½ sw se 15-13-12e, dr.

COMPLETION

Richardson County—Forest City Basin Syndicate et al's Windle-Doge 1, se ne se 3-1n-15e, 6 mi w Falls City pool, Base Kansas City 1225 ft, Hunton 2565 ft, hfw 2602 ft, abnd 2605 ft.

OKLAHOMA

FIRST REPORTS

Comanche County—Hamblen-Good et al's Phillips 1, nec nw 34-1n-13w, mach.

Grady County—Atkinson et al's Billy 1, c nw nw 26-5n-7w, dr.

Marshall County—Johnson Dr. Co. et al's Bound 1, nw nw sw sw 13-6s-6w, dr.

Muskogee County—Car Lyon Oil Co.'s Davis 1, sec 24-14n-18e, dr, 1175 ft.

Okfuskee County—Shell's Davis 1, swc 18-13n-9e, dr.

Pottawatomie County—Kerlyn's Cherry 1, se ne nw 32-8n-5e, rur.

Seminole County—Delaney et al's Clark 1, nec se 30-8n-7e, dr.

COMPLETIONS

Creek County—Irvin Dr. Co.'s Bailey 1, se ne se 1-18n-9e, Mannford dist, Pink lime 2153-58 ft, ran low, abnd 2321 ft.

Kay County—Elders et al's Voehl 1, sec nw 34-27i-2w, Blackwell dist, otd 1200 ft, abnd 1510 ft.

Okfuskee County—Vierson et al's Meyers 1, se ne ne 1-11n-6e, 3 mi e Prague pool, Mayes 4100 ft, Woodford 4182 ft, Misener 4207 ft, Hunton 4216 ft, Sylvan 4385 ft, Viola 4472 ft, Dolomite 4495 ft, first Wilcox 4533-36 ft, second Wilcox 4576 ft, electrolog, abnd 4606 ft. Davon Oil Co.'s Sporleder 1, c sw nw 35-12n-9e, 2 mi n Okemah, Hunton 3918 ft, td 3978 ft, pb 3960 ft, perf Upper Hunton, hfw, abnd 3978 ft.

Seminole County—Amerada et al's Campbell 1, cn½ sw sw 30-9n-6e, ¾-mi s East Earlsboro pool, new field, first Wilcox 4220 ft, td 4274 ft, shot 80 quarts 4233-73 ft, 432 bbls. 43.3-gr.

SOUTH TEXAS

FIRST REPORTS

Atascosa County — Henderson Coquat's Beshears 1, 60-ac tr, J. S. Loving sur, s Campbellton, lcn.

Bastrop County—Marts & Beaven's Warnet 1, 94-ac tr, J. Billingsly sur, 3 mi sw Cedar Creek, 1800 ft test, lcn.

Bexar County—S. G. Winter's Winter 1, 100-ac lse, Fernando Rodriguez sur, 9 mi sw San Antonio, 1500 ft test, lcn.

DeWitt County—Atlantic Ref. Co.'s Zengerle 1, 89.33-ac lse, Charles Lockhart sur, 4100 ft w W. E. Conwell 1, 4000 ft ne Pearl Conwell, gas-distillate disc well, lcn.

Duval County—G. W. Basom, Tr.'s Nueces Land & Livestock 1, sur 175, ⅝ mi sw Munson fld, Basom's rig, lcn.

Guadalupe County—J. H. Russell and G. H. Blumberg's Weinert 1, 20-ac lse, 7 mi fr Seguin, lcn for 1200-ft test.

Jackson County — W. Stewart Boyle's Mauritz Bros. 1, combined blks 9 and 10, sec 21, Morris & Cummings sur, ab 238, 4 mi se Ganado, lcn for 6250-ft test.

Jim Hogg County—V. F. Neuhaus' Gallagher 1, blk 385, Pippin subd, El Randado gr, mi.

Karnes County—Luling O. & G. Co.'s Newberry 1, blk 29, R. E. Dalton subd, Newberry Farm Lands, Carlos Martinez gr, 2 mi s Green, 950 ft e Clyde Echols' Newberry 1, Luling rig, lcn.

Live Oak County—Humphries & Hotchkin's Webb 1, blk 22, William O'Docherty sur, 6 mi s and w of Oakville fld, ¾ mi due nw Three Rivers, 8-in csg 78 ft, dr plugs 78 ft, Humphries & Hotchkin rig. Henderson Coquat's Goebel 1, 661.8-ac tr, 362-ac lse, Refugio County School Land sur 6, 4 mi ne Oakville, lcn 8000-ft test.

McMullen County—Dan Purvis' Nueces Land & Livestock 1, R. E. Halter sur 26, 7 mi n Munson fld, mir for 1350-ft test. W. M. Stephenson's Corp 4, 100-ac lse, 4 mi nw Calliham, lcn for 1500-ft test.

Nueces County—Henshaw Bros.' Dougherty 1, 1707-ac tr, 100-ac lse, sh 7, Bluntzer partn, Casa Blanca gr, 6 mi se of Orange Grove townsite, lcn for 6500-ft test, Henshaw rig. H. J. Mosser's Eggleston 1, 80-ac tr in Richard King sec 25, 3 mi nw Agua Dulce, elev 136.2 ft, lcn for 6500-ft test.

Starr County—Williams et al's Garcia 1, sh 215, porc 90, 80-ac lse on farmout fr W. W. Zimmerman, 1 mi w Boyle fld, sp.

Webb County—Cash & Reynolds' Frost 2, CCSD&RGNG sur 29, blk 2, on 14,080-ac tr, 10 mi n Mirando City, lcn for 2300-ft test.

COMPLETIONS

Bee County—Magnolia's Page Bros. 1, 123.86-ac tr, W. T. Evans sur, 3 mi sw Pettus townsite, Pettus 3842 ft, abnd 3960 ft, Magnolia rig.

Brooks County—West Prod. Co.'s Ehlers 1, sec 12, Burton & Danforth subd, Francisca Guerra (Loma Blanca) gr, 6½ mi e and ne Falfurrias, abnd 8824 ft, West rig.

Duval County—Robert Coker's Smith-Corkill Est. 1, e½ sur 490, 3 mi s Hoffman fld, abnd 3521 ft.

Jim Hogg County—Jay Simmons & V. G. Schimmel's Gutierrez 1-A, blk 2, sur 144, 6 mi sw Randado, 40 ft s No. 1, junked at 2704 ft (replacement hole), abnd 3615 ft, contracted by Glen Harroun.

Live Oak County—Henderson Coquat's McLean 1, 3500 ft nw of prod at Oakville, abnd 3596 ft, Coquat's rig. Danciger Oil Refineries' San Antonio Joint Stock & Land Bank 1, blk 13, Thomas Henry sur, 2¾ mi w Three Rivers, abnd 1801 ft, contracted by Arthur Coyle.

San Patricio County—Henderson Coquat and Wilcox Oil & Gas Co.'s Menger 1, sec 11, George H. Paul's subd of Welder rch, 3500 ft nw Seaboard's Blumburg 1, abnd 6004 ft, Henderson Coquat, contractor.

Webb County—Edwards & Boyd's Laurel Bros. 1, sur 717, 320-ac tr, 4 mi se Mirando City, abnd 2656 ft.

Zapata County—Neilson & Palmer's Maryland Trust Co. 1, sur 314, 2 mi ne Escobas, abnd 2311 ft.

WEST TEXAS

FIRST REPORT

Pecos County—Keene & Beasley's Slaughter 1, se se ne T. & St. L. Ry. sec 30, blk 129, mim.

COMPLETIONS

Ector County—Forest Dev. Corp.'s Bradley 1, sec T&P sec 18, blk 43, T-3-S, elev 3041 ft, Yates sand 2870 ft, brown lime 3560 ft, solid lime 3795 ft, pb from 4410 ft to use 10,000 gals acid 4310-62 ft, pump 77 bbls, new pool.

Pecos County—Davis & White's Fromme 1, w¼ of n¼ H&GN sec 110, blk 10, elev 2400 ft, 1000 gals acid in lime pay 1865-88 ft, pump 60 bbls 12 hrs, new pool.

Ward County—Sinclair Prairie's Wirt Davis 1, north cor w¼ H&TC sec 32, blk 4, elev 2457 ft. salt series 610-1625 ft, Yates sand 1725 ft, abnd 3864 ft.

EAST TEXAS

FIRST REPORT

San Augustine County—Roper & Todd's Long Bell Lumber Co. 1, ne part 2238-ac tr, Nathan Hyden sur, 12 mi se Broadus, lcn.

COMPLETIONS

Anderson County—Tex-Harvey Oil Co.'s Cartmel 1, blk 4, E. Ewing sur, elev 383 ft, Pecan chalk 3850-4000 ft, Austin chalk 4955-5230 ft, Woodbine 5493 ft, abnd 5533 ft.

Navarro County—Coffield & Guthrie's Hines 1-A, J. McNeal sur, abnd 2906 ft.

NORTH TEXAS

FIRST REPORTS

Archer County—King Oil Co.'s Taylor 1, nw nw ATNCL sec 13, lcn for 5000-ft test.

Wilbarger County—Walter Gant et al's Mock 1, sw H&TC sec 23, blk 11, mim.

Young County—A. Kriss et al's Willard 1, se ne TE&L sec 224, lcn. Jeffery Est. et al's Fee 1, se se TE&L sec 47, lcn.

COMPLETIONS

Baylor County—British American O.P. Co.'s Turbeville 1, c n½ ne se T&NO sec 198, Canyon lime 2514 ft, 2500 gals acid 2514-22 ft, flowed 336 bbls oil 10 hrs.

Young County—W. R. Stafford et al's Hamilton 1, sw nw TE&L sec 203, abnd 807 ft.

TEXAS GULF COAST

FIRST REPORTS

Grimes County—Pacific-Irwin's Schoenfeld 1, R. O. Lusk sur, Magnolia pros, farm-out Standard of Texas, Humble, lcn 8500-ft test.

Waller County—John Mayo and T. A. Carlton Dr. Co.'s Donigan 1, Wm. Cooper sur, Brookshire area, lcn 8000 ft Wilcox test.

COMPLETIONS

Chambers County—Humble's State 3-A-248, Red Fish Reef fld, Galveston Bay, new sd 10,327-343 ft, flwg 156 bbl 35.6-ga via ⅛-in ch, tbg/csg pressure 1725/0 lbs.

Fayette County—O. C. Garvey's Meyer 1, J. Murphy sur, 3 mi ne Fayetteville, farm-out Texas Co., Wilcox low at 5320 ft, sw sds Wilcox, abnd 5865 ft.

Jefferson County—Sun's Broussard-Hebert 8, La Belle fld, sd 6528-45 ft, flwg 264 bbl dly via ¼-in ch, tbg/csg pressure 225/0 lbs.

Matagorda County — Ohio's Blackburn 1, Pettus Lge, Sugar Valley pros, 15-min dst 8200 ft rec little oil with gas-cut mud, eletrolog 9100 ft, abnd 9506 ft.

WEST CENTRAL TEXAS

FIRST REPORTS

Coleman County—A. P. Heinze et al's Kincaid 1, nwc e½ sw BBB&C sec 41, lcn.

Shackelford County — Roeser-Pendleton & Conoco's Cook 1-A-118, c se sw E. T. Ry. sec 118, dr 130 ft.

COMPLETIONS

Callahan County—N. D. Gallagher et al's Grissom 1, se se ne S.P. sec 2, blk 8, abnd 1775 ft.

Coleman County—States Oil Corp.'s Morris 1-B, sw part S. A. Carroll sur A-38, abnd 4375 ft.

Jones County—Thos. D. Humphrey et al's Lipham 1, T&P sec 18, blk 15, elev 1696 ft, abnd 2751 ft.

Tarrant County—J. M. Hickey et al's Baltzelle 1, W. M. Scott sur, jkd 935 ft.

MEN IN THE INDUSTRY'S NEWS

ALEX U. McCANDLESS, Robinson, Illinois, president of Mahutska Oil Company and an Illinois producer for 34 years, has been elected president of the Illinois-Indiana Petroleum Association.

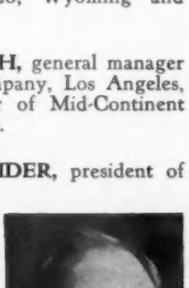
Other officers named were C. C. Carroll, The Ohio Oil Company, Marshall, Illinois, and A. F. Lager, The Siosi Company, Terre Haute, Indiana, vice presidents; T. B. Steele, Kewanee Oil Company, Robinson, treasurer; R. B. Kelly, The Pure Oil Company, Olney, Illinois, secretary, and Lee Mulvihill, Robinson, executive secretary. Officers, together with Frederick Grumme, Premium-Bolyard Company, Indianapolis, and Merle Becker, W. C. McBride, Inc., St. Louis, comprise the executive committee.

Directors for 1941 are J. T. Cumbie, Magnolia Petroleum Company, Mattoon, Illinois; William S. Corwin, Tide Water Associated Oil Company, Robinson; H. N. Pardee, The Texas Company, Tulsa; William A. Watkins, The Carter Oil Company, Mattoon; Frank B. Barnes, Craig & Lowrie, Robinson; William Bell, Bell Brothers, Robinson; John Baldwin, Snowden & McSweeney Company, Bridgeport, Illinois; E. G. Robinson, Shell Oil Company, Centralia, Illinois; P. E. Taggart, Big Four Oil & Gas Company, Bridgeport, Illinois; Asa Lee, Kingwood Oil Company, Effingham, Illinois; E. J. Reading, Sun Oil Company, Evansville, Indiana; C. J. Haas, Adams Oil & Gas Company, Centralia, and Steele, Lager, Kelly, Carroll, Grumme, McCandless and Becker.

P. L. BROOKS, in the Dallas sales office of The Parkersburg Rig & Reel Company, Parkersburg, West Virginia, has been named Pacific Coast manager with headquarters at 4001 East Washington Boulevard, Los Angeles. He will have charge of sales in California, Oregon, Washington, Colorado, Wyoming and Montana.

WALTER G. L. SMITH, general manager of E. M. Smith Company, Los Angeles, is concluding a tour of Mid-Continent and Gulf Coast fields.

DR. LUTHER C. SNIDER, president of the American Association of Petroleum Geologists and consulting geologist for Cities Service Oil Company, will become professor of geology at University of Texas on January 1. He plans to arrive in Austin in time to attend the annual convention of the Geological Society of America at Austin December 26-28.



Snider taught school in Indiana and Oklahoma for six years, had a teaching fellowship at the University of Chicago, and for six years served as assistant director and geologist with the Oklahoma Geological Survey.

E. J. STRAWN, Shell Oil Company, Tulsa, has been nominated as president of the Petroleum Motor Transport Association of Oklahoma for 1941. Other nominees to be voted on December 20 include: J. W. Rayburn, Tide Water Associated Oil Company, Tulsa, for first vice president; Homer Newby, Cities Service Oil Company, Bartlesville, for second vice president, and W. H. Barclay, Darby Petroleum Corporation, Tulsa, for secretary-treasurer. Nominees for directors include Joe A. Huitt, Deep Rock Oil Corporation, Drumright; H. W. Ladd, Stanolind Oil & Gas Company, Tulsa, and H. J. Chambers, Oklahoma Natural Gas Company, Tulsa.

JOHN ROBESON, Eastern Division junior engineer for The Carter Oil Company, is now an engineer with Standard Oil Company of Venezuela. Byron W. Cain, formerly in the accounting department of The Carter Oil Company, is now field accountant, while LeRoy Becker, geologist, is junior paleontologist with Standard Oil Company of Venezuela. They will make headquarters at Caripito, Venezuela.

JOHN INKSTER, geologist for Shell Oil Company, Wichita, has been elected president of the Kansas Geological Society, succeeding Anthony Folger, Gulf Oil Corporation. Other officers are J. P. McKee, vice president; Lee Cornell, secretary-treasurer; and Don Wines, Zenas E. Stucky and Emmett Elledge, directors. All are of Wichita.

J. O. LASHER, advertising director of American Chain & Cable Company, New York, has designed a patriotic coat lapel button that is attracting considerable attention. It is a picture of Uncle Sam, beneath which appear the words "I am proud he is my uncle." Lasher is donating all royalties to the American Red Cross. The cost of the buttons is quite low ($27.50 for 1000), and they may be obtained from Parisian Novelty Company, Chicago, Illinois.

A. P. LOSKAMP, West Texas district manager of Barnsdall Oil Company's geological and lease activities, with headquarters at Midland, has resigned to accept a similar position with Union Oil Company of California, which is establishing an office in Midland on January 1. J. D. McClure, who has been with Barnsdall Oil Company in Michigan, has been designated as Loskamp's successor.

A. J. BARTHELOW, laboratory engineer for Baroid Sales Division, Tulsa, will start a year's active duty, effective December 20, at Fort Logan, Colorado. Barthelow is a second lieutenant in the Engineers Corps.

WILLIAM E. SHORT, engineer for Frick-Reid Supply Corporation, Tulsa, will report December 20 for a year's active duty at Fort Crockett, Galveston. He is a first lieutenant in the Coast Artillery.

PAUL L. GUARIN, Shell Oil Company, last week was named chairman of the Houston chapter of the American Petroleum Institute's Division of Production, succeeding Warren L. Baker, THE OIL WEEKLY.

Other officers named were J. U. Teague, Hogg Oil Company, vice chairman in charge of programs, succeeding T. H. Andrews, Stanolind Oil & Gas Company; Bowman Thomas, Humble Oil & Refining Company, vice chairman in charge of membership, succeeding Harry L. Edwards, Harry L. Edwards Drilling Company, and Van D. Bennett, Bethlehem Supply Company, secretary-treasurer, succeeding Guarin.

New members of the advisory board, elected for 2-year terms, are Charles Bedford, Stanolind Oil & Gas Company; George B. Corless, Humble Oil & Refining Company; E. V. Hewitt, Pan American Production Company; Paul Hubbard, Gulf Oil Corporation; Herbert Lane, Crown Central Petroleum Corporation, and Baker.

LEE S. MILLER, petroleum engineer for the Michigan Department of Conservation and a member of the engineering committee of the Interstate Oil Compact Commission, was a recent visitor in Tulsa, where he attended the wedding of his son, Dan Miller.

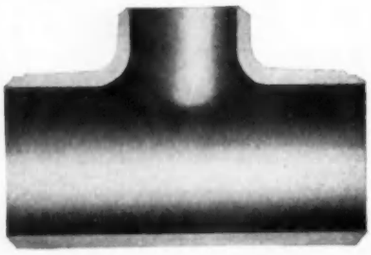
M. S. PATTON, Shell Oil Company, has been transferred from Great Bend, Kansas, to Stroud, Oklahoma; Mason Rudd has been moved from McPherson, Kansas, to Lucien, Oklahoma, and John Bailey from Stroud to McPherson. They are exploration engineer trainees.

FRED B. BRANSON, assistant auditor and secretary for Gulf Oil Corporation and Gulf Refining Company at Tulsa, was recently transferred to the general office at Pittsburgh and appointed general auditor for the production and pipe line divisions. Edward D. Loughney succeeds Branson as assistant auditor at Tulsa.

E. B. MILLER, JR., Tide Water Associated Oil Company, Kilgore, last week was named chairman of the East Texas Chapter of the American Petroleum Institute's Division of Production, succeeding J. P. Straight, Cities Service Oil Company, Gladewater.

E. B. Miller

Other officers are: Robert M. Bass, Robert M. Bass, Inc., Kilgore; Murray C. Sells, Sells Petroleum, Inc., Longview, and B. E. Moir, The Atlantic Refining Company, Longview, vice chair-



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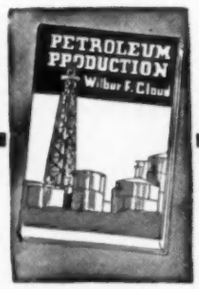

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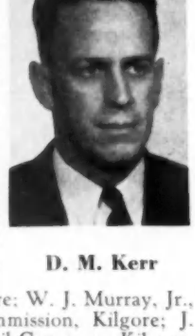
MEN IN THE INDUSTRY'S NEWS

men; D. M. Kerr, Lufkin Foundry & Machine Company, Kilgore, secretary-treasurer, and John H. Murrell, Shell Oil Company, Kilgore, assistant secretary-treasurer.

Members of the advisory committee are: Straight, chairman; M. L. Brown, Sun Oil Company, Kilgore; A. Julian, The Texas Company, Gladewater; C. P. Parson, The Pure Oil Company, Van; L. C. Peters, Humble Oil & Refining Company, London; N. G. Moore, Pan American Pipe Line Company, Kilgore; W. S. Morris, East Texas Engineering Association, Kilgore; R. D. Risser, Shell Oil Company, Kilgore; W. J. Murray, Jr., Texas Railroad Commission, Kilgore; J. W. Pittman, Shell Oil Company, Kilgore; C. D. Hubbard, Weaver-Crim Corporation, Laird Hill; Harvey Lee, Magnolia Petroleum Company, Greggton; Roger Lacy, Longview; L. P. O'Neill, General American Oil Company, Gladewater; Joe Zeppa, Delta Drilling Company, Tyler; C. C. Sloan, The Ohio Oil Company, Henderson; E. W. Chatterton, Federal Tender Board, Kilgore; P. C. Porter, Blackwell Oil & Gas Company, Kilgore; J. A. Walker, Magnolia Petroleum Company, Kilgore; J. E. Springer, Tide Water Associated Oil Company, Kilgore; C. E. Taber, C. L. McMahon, Inc., Tyler, and Floyd Brett, Sinclair Prairie Oil Company, Troup.



D. M. Kerr

Members of the program committee are: R. J. Dobson, Shell Oil Company, Kilgore; M. L. Mayfield, Cities Service Oil Company, Gladewater; F. J. Mikeska, Gulf Oil Corporation, Kilgore, and F. A. Schell, Jr., Stanolind Oil & Gas Company, Greggton.

Members of the membership committee are: Guy Wetzel, The National Supply Company, Longview; J. J. Jenkins, Jenkins Drilling Company, Kilgore; Ben W. Roberts, Jackson, Wise & Snedden, Tyler; R. O. Sims, Bob Sims Teaming & Trucking Company, Kilgore; Eddie Simms, Blackstone Cafe, Kilgore; R. T. Lewis, Hercules Motors Corporation, Kilgore; Jay Coleman, Oil Well Supply Company, Kilgore, and C. C. Sloan, The Ohio Oil Company, Henderson.

H. K. IHRIG, engaged in technical service work in Oklahoma City and Kansas for Kobe, Incorporated, has been named Tulsa district sales representative. After attending the Missouri School of Mines and Oklahoma A. & M. College, he joined the petroleum engineering department of Wilcox Oil & Gas Company, and later Phillips Petroleum Company. He joined the Oil & Gas Journal in an editorial capacity in 1936.

THURMAN H. MYERS, 50, chief engineer and geologist for Carnegie Natural Gas Company, died December 9 after an illness of several months. He entered the oil and gas industry in 1917 as geologist in Cuba for Benedum-Trees interests, was superintendent and geologist for The Carter Oil Company from 1918 to 1921, manager and geologist for Caldwell Oil Corporation in Kentucky from 1921 to 1924, and superintendent and geologist for Llano Oil Company from 1926 to 1930. He worked a year for Columbia Gas & Electric Corporation, resigning in 1931 to become manager and geologist for Penn United Gas Company.

EDWARD A. PHOENIX, assistant sales promotion manager in charge of industrial products for Johns-Manville Sales Corporation, was honored December 3 by a luncheon in New York which marked his completion of 25 years' service with the organization.

GEORGE W. WALTON, connected with Emsco Derrick & Equipment Company for the past 15 years, recently as vice president and sales manager, is taking a vacation from business during the next few months, after which he will take a new connection in the petroleum equipment industry. He joined Transcontinental Oil Company as purchasing agent shortly after serving in the air service during the World War; was with The National Supply Company for five years, part of the time in London, and later was with Wilson-Snyder Manufacturing Company.

JOHN LESLIE DRAKE, 70, Illinois and Indiana cable-tool contractor, died in Evansville December 8 after a short illness. He first entered the oil business in 1895 with the opening of the old "Trenton Rock" field near Kokomo, Indiana. He had a hand in developing the Casey field of Clark and Crawford Counties, Illinois, in 1905, had worked in Kansas, and was one of the first operators in the lime field near Bowling Green, Kentucky. With two sons, Niel and Truman, he wildcatted throughout southern Indiana, and in 1930 opened the Effinger pool north of Evansville.

ROBERT DONOVAN, Kansas district engineer for The Texas Company, has entered air corps training in California. Van S. Merl Smith, Jr., is starting a year's active duty in the field artillery at Fort Dix, New Jersey.

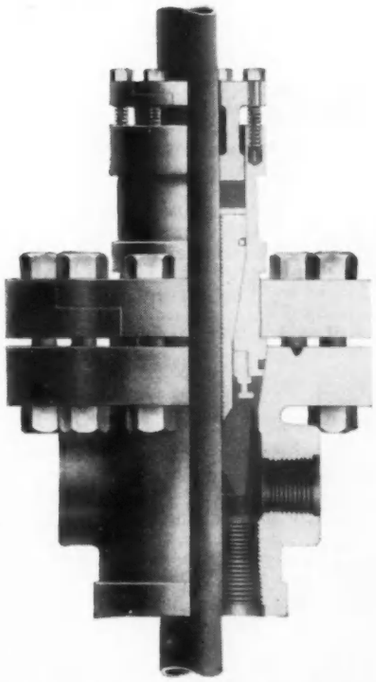
D. V. CARTER, chief production engineer for Magnolia Petroleum Company, has returned to his Dallas headquarters after spending the past month touring oil properties of Socony-Vacuum Oil Company in South America.

NOTES FOR THE Equipment Buyer and User

Tubing Head
McEVOY COMPANY

A stripper-type tubing head with slip suspension of tubing has been announced by McEvoy Company, Houston.

The head employs a stripper rubber of new design with exceptional thickness at point of greater wear to provide increased stripper life. A worn stripper is renewed by screwing a new rubber into the tubing hanger.



McEvoy Type LDSB Tubing Head

Slips located just above the stripper permit movement of tubing to actuate production packers and to allow final suspension of tubing at any desired point. The design permits change of adjustable, confined neoprene packing above the slips without disturbing slips or tubing.

Any of the company's Series L tubing hangers fit interchangeably in the body, permitting substitution of lower cost hangers when strippers are no longer necessary. The hanger may be installed or removed through blowout preventers.

Designated Type LDSB, the tubing head is available in a complete range of sizes and test pressures.

Speed Reducer
THE AMERICAN PULLEY COMPANY

A speed reducer consisting of a helical-gear reduction unit which mounts directly on the shaft of the driven machine and a standard belt drive between the motor and the input shaft of the reduction unit, has been announced by The American Pulley Company, Philadelphia.

The unit has a standard fixed ratio of 13/1, with any greater or lesser ratios accomplished by the primary belt drive. In application, where an overall reduction ratio of 52/1 is desired, for example, a belt drive is selected with a ratio of 4/1.

Five reduction units cover applications from ½- to 30-horsepower, and provide speeds between 11 and 215 revolutions per minute. No special foundations are required, as the unit mounts directly on the shaft.

Pipe Threader
THE OSTER MANUFACTURING COMPANY

A portable pipe machine, designated Model 502 Pipe Master and equipped with a sliding, floating type die-head described as adjustable and quick-opening, has been announced by The Oster Manufacturing Company, 2057 East 61 Place, Cleveland.

The die-head is of front-cutting design to make it possible to handle nipples as short as 3½ inches in the 2-inch size without use of a special nipple chuck. A cone-fluted reamer of new design is mounted on the front of the die-head and integral with it to enable the operator to handle close work efficiently. The cut-off device uses standard cutter wheels and rollers, and is of all-steel construction.

A carriage that floats on all-steel ways is designed to allow the die-head and dies to conform to irregularities in the pipe. The carriage, fed by a hand lever, may be removed to lighten the carrying weight of the machine, if desired.

A three-jaw centering chuck on the rear of the spindle is provided to assist the front gripping chuck in centering the longer lengths of pipe. A thread-length gauge can be set to provide duplicate, standard-length threads. An oil pump geared direct to the motor, with adjustable relief valve, supplies cutting oil to the dies. All-steel base is welded for maximum strength and minimum weight.

Oster's Model 502 Pipe Master

Power is furnished by a ½-horsepower Black & Decker universal, reversible variable-speed motor that may be operated from an ordinary electric light socket.

Overall length of the machine is 46 inches, width is 19½ inches, height is 18 inches, and weight is 280 pounds complete, and 215 pounds with carriage removed.

Regulator
FISHER GOVERNOR COMPANY

A new regulator for high and intermediate gas pressure reduction, designated Type 630, has been announced by Fisher Governor Company, Marshalltown, Iowa.

Design of the valve permits automatic maintenance of reduced pressure at a set point regardless of fluctuations in inlet pressure and increases in demand

Fisher's Type 630 Regulator

load. Diaphragm assemblies for reduced pressure ranges of 0 to 30 pounds, and 25 to 150 pounds, respectively, are available, and are interchangeable on all sizes.

Sizes available are 1-, 1¼-, 1½- and 2-inch, with three orifice sizes, ¼-, ⅜- and 1-inch. They are designed for inlet pressures up to 1000 pounds per square inch and for reduced pressure range of 2 to 150 pounds per square inch.

Interval Timer
PHOTOSWITCH INCORPORATED

An electronic interval timer, designated Type T15 and designed for ranges from 1/20-second to 2 minutes, has been announced by Photoswitch Incorporated, 21 Chestnut Street, Cambridge, Massachusetts.

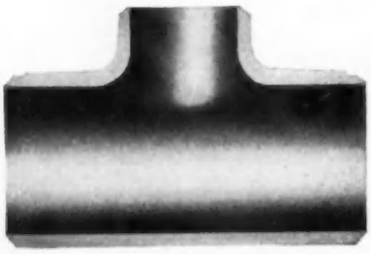
The device employs a snap-action relay of 1000 watts capacity. It is described as flexible with reference to actuating control, permitting both momentary push button and sustaining contacts control. It is universal for six timing ranges represented by timing valves snapped into a clip.

Trap
W. H. NICHOLSON & COMPANY

A weight-operated trap for steam, air or gasoline service in pressures 500 to 1500 pounds and maximum temperature of 1000° F., has been announced by W. H. Nicholson & Company, 12 Oregon Street, Wilkes-Barre, Pennsylvania.

It is furnished in one body size with inlet and outlet flanges to suit either Series 60 or Series 150 American standard raised face connections, ½-, ¾- or 1-inch size, male and female, or tongue-and-groove flanges are furnished if desired.

Features include cast-steel body and cover; Stellited valve and seat; stainless steel float, latches, brackets and levers; spiral ply stainless steel-asbestos ring gaskets; heat-treated alloy steel stud



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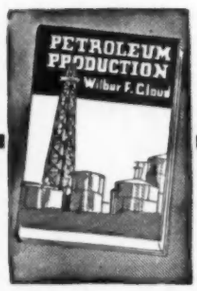

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MEN IN THE INDUSTRY'S NEWS

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D. M. Kerr

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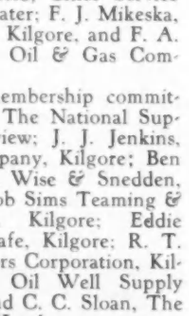
H. K. IHRIG, engaged in technical service work in Oklahoma City and Kansas for Kobe, Incorporated, has been named Tulsa district sales representative. After attending the Missouri School of Mines and Oklahoma A. & M. College, he joined the petroleum engineering department of Wilcox Oil & Gas Company, and later Phillips Petroleum Company. He joined the Oil & Gas Journal in an editorial capacity in 1936.



THURMAN H. MYERS, 50, chief engineer and geologist for Carnegie Natural Gas Company, died December 9 after an illness of several months. He entered the oil and gas industry in 1917 as geologist in Cuba for Benedum-Trees interests, was superintendent and geologist for The Carter Oil Company from 1918 to 1921, manager and geologist for Caldwell Oil Corporation in Kentucky from 1921 to 1924, and superintendent and geologist for Llano Oil Company from 1926 to 1930. He worked a year for Columbia Gas & Electric Corporation, resigning in 1931 to become manager and geologist for Penn United Gas Company.

EDWARD A. PHOENIX, assistant sales promotion manager in charge of industrial products for Johns-Manville Sales Corporation, was honored December 3 by a luncheon in New York which marked his completion of 25 years' service with the organization.

GEORGE W. WALTON, connected with Emsco Derrick & Equipment Company for the past 15 years, recently as vice president and sales manager, is taking a vacation from business during the next few months, after which he will take a new connection in the petroleum equipment industry. He joined Transcontinental Oil Company as purchasing agent shortly after serving in the air service during the World War; was with The National Supply Company for five years, part of the time in London, and later was with Wilson-Snyder Manufacturing Company.

JOHN LESLIE DRAKE, 70, Illinois and Indiana cable-tool contractor, died in Evansville December 8 after a short illness. He first entered the oil business in 1895 with the opening of the old "Trenton Rock" field near Kokomo, Indiana. He had a hand in developing the Casey field of Clark and Crawford Counties, Illinois, in 1905, had worked in Kansas, and was one of the first operators in the lime field near Bowling Green, Kentucky. With two sons, Niel and Truman, he wildcatted throughout southern Indiana, and in 1930 opened the Effinger pool north of Evansville.

ROBERT DONOVAN, Kansas district engineer for The Texas Company, has entered air corps training in California. Van S. Merl Smith, Jr., is starting a year's active duty in the field artillery at Fort Dix, New Jersey.

D. V. CARTER, chief production engineer for Magnolia Petroleum Company, has returned to his Dallas headquarters after spending the past month touring oil properties of Socony-Vacuum Oil Company in South America.

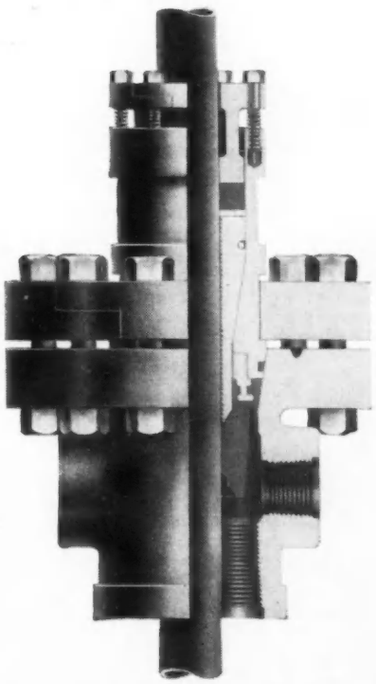
NOTES FOR THE Equipment Buyer and User

Tubing Head

McEVOY COMPANY

A stripper-type tubing head with slip suspension of tubing has been announced by McEvoy Company, Houston.

The head employs a stripper rubber of new design with exceptional thickness at point of greater wear to provide increased stripper life. A worn stripper is renewed by screwing a new rubber into the tubing hanger.



McEvoy Type LDSB Tubing Head

Slips located just above the stripper permit movement of tubing to actuate production packers and to allow final suspension of tubing at any desired point. The design permits change of adjustable, confined neoprene packing above the slips without disturbing slips or tubing.

Any of the company's Series L tubing hangers fit interchangeably in the body, permitting substitution of lower cost hangers when strippers are no longer necessary. The hanger may be installed or removed through blowout preventers.

Designated Type LDSB, the tubing head is available in a complete range of sizes and test pressures.

Speed Reducer

THE AMERICAN PULLEY COMPANY

A speed reducer consisting of a helical-gear reduction unit which mounts directly on the shaft of the driven machine and a standard belt drive between the motor and the input shaft of the reduction unit, has been announced by The American Pulley Company, Philadelphia.

The unit has a standard fixed ratio of 13/1, with any greater or lesser ratios accomplished by the primary belt drive. In application, where an overall reduction ratio of 52/1 is desired, for example, a belt drive is selected with a ratio of 4/1.

Five reduction units cover applications from ½- to 30-horsepower, and provide speeds between 11 and 215 revolutions per minute. No special foundations are required, as the unit mounts directly on the shaft.

Pipe Threader

THE OSTER MANUFACTURING COMPANY

A portable pipe machine, designated Model 502 Pipe Master and equipped with a sliding, floating type die-head described as adjustable and quick-opening, has been announced by The Oster Manufacturing Company, 2057 East 61 Place, Cleveland.

The die-head is of front-cutting design to make it possible to handle nipples as short as 3½ inches in the 2-inch size without use of a special nipple chuck. A cone-fluted reamer of new design is mounted on the front of the die-head and integral with it to enable the operator to handle close work efficiently. The cut-off device uses standard cutter wheels and rollers, and is of all-steel construction.

A carriage that floats on all-steel ways is designed to allow the die-head and dies to conform to irregularities in the pipe. The carriage, fed by a hand lever, may be removed to lighten the carrying weight of the machine, if desired.

A three-jaw centering chuck on the rear of the spindle is provided to assist the front gripping chuck in centering the longer lengths of pipe. A thread-length gauge can be set to provide duplicate, standard-length threads. An oil pump geared direct to the motor, with adjustable relief valve, supplies cutting oil to the dies. All-steel base is welded for maximum strength and minimum weight.

Oster's Model 502 Pipe Master

Power is furnished by a ½-horsepower Black & Decker universal, reversible variable-speed motor that may be operated from an ordinary electric light socket.

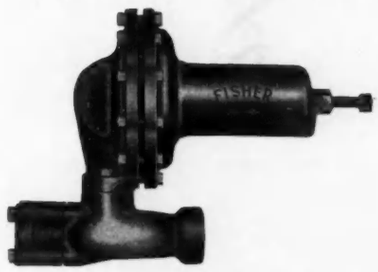
Overall length of the machine is 46 inches, width is 19½ inches, height is 18 inches, and weight is 280 pounds complete, and 215 pounds with carriage removed.

Regulator

FISHER GOVERNOR COMPANY

A new regulator for high and intermediate gas pressure reduction, designated Type 630, has been announced by Fisher Governor Company, Marshalltown, Iowa.

Design of the valve permits automatic maintenance of reduced pressure at a set point regardless of fluctuations in inlet pressure and increases in demand



Fisher's Type 630 Regulator

load. Diaphragm assemblies for reduced pressure ranges of 0 to 30 pounds, and 25 to 150 pounds, respectively, are available, and are interchangeable on all sizes.

Sizes available are 1-, 1¼-, 1½- and 2-inch, with three orifice sizes, ¼-, ⅜- and 1-inch. They are designed for inlet pressures up to 1000 pounds per square inch and for reduced pressure range of 2 to 150 pounds per square inch.

Interval Timer

PHOTOSWITCH INCORPORATED

An electronic interval timer, designated Type T15 and designed for ranges from 1/20-second to 2 minutes, has been announced by Photoswitch Incorporated, 21 Chestnut Street, Cambridge, Massachusetts.

The device employs a snap-action relay of 1000 watts capacity. It is described as flexible with reference to actuating control, permitting both momentary push button and sustaining contacts control. It is universal for six timing ranges represented by timing valves snapped into a clip.

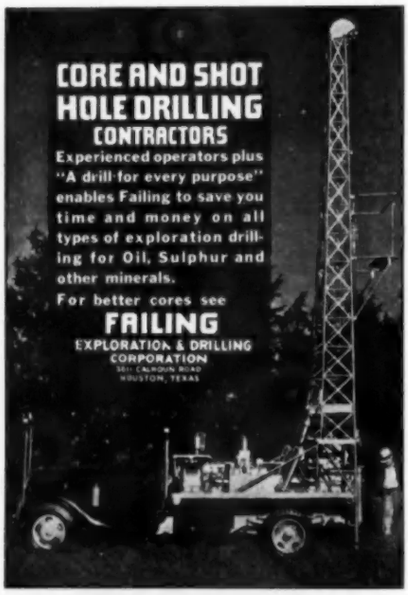
Trap

W. H. NICHOLSON & COMPANY

A weight-operated trap for steam, air or gasoline service in pressures 500 to 1500 pounds and maximum temperature of 1000° F., has been announced by W. H. Nicholson & Company, 12 Oregon Street, Wilkes-Barre, Pennsylvania.

It is furnished in one body size with inlet and outlet flanges to suit either Series 60 or Series 150 American standard raised face connections, ½-, ¾- or 1-inch size, male and female, or tongue-and-groove flanges are furnished if desired.

Features include cast-steel body and cover; Stellited valve and seat; stainless steel float, latches, brackets and levers; spiral ply stainless steel-asbestos ring gaskets; heat-treated alloy steel stud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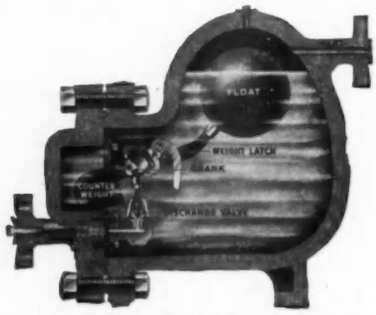


Nicholson's Weight-Operated Trap

bolts, threaded full length; intermittent action, and water-sealed discharge valve.

In operation, water entering trap raises float to its highest point of travel, where it releases the weight latch, allowing counterweight to fall. The counterweight is attached to a crank which lifts the discharge valve wide open. The discharge valve is then held open by the link latch until the discharging water carries float to lowest point of its travel. At this point, the weight latch again engages counterweight, which has been lifted by the falling float, and the link latch disengages, permitting discharge valve to close. Design precludes wire-drawing of valve and seat by intermittent opening and closing of the valve.

The float is instrumental only in releasing the counterweight, which, as it falls, opens the discharge valve. Opening and closing of the valve does not depend upon the buoyancy of weight of float.

Valves and seats are stocked for 12 pressure ranges, 0 to 500 pounds, to 550, to 600, to 650, to 700, to 800, to 900, to 1000, to 1100, to 1200, to 1350, and to 1500 pounds.

Bearings

Link-Belt Company, 307 North Michigan Avenue, Chicago, has issued Data Book 1775 containing 88 pages descriptive of its line of bearings, termed Friction Fighter bearings. Complete tables of sizes, dimensions, weights and list prices are given, and also included are tables of load ratings and minimum life expectancies. A number of pages are devoted to selection of the proper unit for each class of service, and engineering information is given.

Arc Welder

GENERAL ELECTRIC COMPANY

A DC arc welder to provide any welding current from 25 to 250 amperes has been announced by General Electric Company, Schenectady, New York. It is designed to allow all-day manual welding with currents up to 200 amperes, using electrodes from 1/16- to 3/16-inch in diameter, and for use of electrodes as large as ¼-inch on occasional short jobs.

The unit provides for instant recovery of the voltage to an extent greater than the arc voltage after each short circuit to prevent time-wasting arc pop-outs, and is designed to never allow current peaks to exceed three times the steady short-circuit current on any adjustment, thus preventing excessive heat and spatter and resulting in a saving of electrodes.

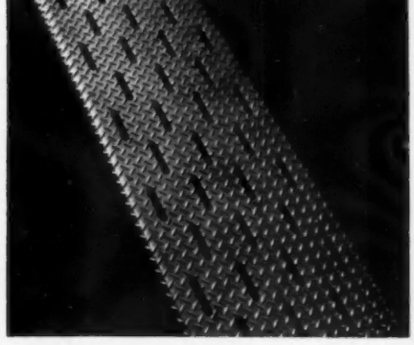
Other features are isothermic overload protection for the motor, self-excitation to eliminate the necessity for an extra generating unit, quick adjustment of welding current, and horizontal mounting.

Self-sealed ball bearings are used.

Steel Plate

ALAN WOOD STEEL COMPANY

A slotted-type diamond steel running board, designated Type AW, has been announced by Alan Wood Steel Company, Conshohocken, Pennsylvania.



Alan Wood Type AW Running Board

Made from solid steel plate to minimize possibilities of corrosion and to provide maximum service, design of the product employs slots in a manner that provides protection against falling accidents and facilitates drainage. Slots are hand-hold size for extra security.

Cutting Steel

McKenna Metals Company, Latrobe, Pennsylvania, has issued a chart listing horsepower requirements for cutting steel with Kennametal-tipped tools. The chart is designed to enable the tool supervisor to advise the machine operator what depth and feed the machine will pull in cutting steel with Kennametal tools.

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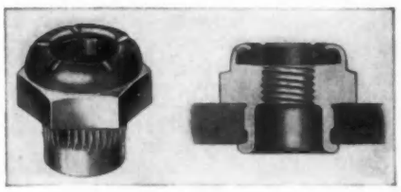
NOTES FOR THE Equipment Buyer and User

Lock Nut

ELASTIC STOP NUT CORPORATION

A self-locking nut with knurled shank, designed for fastening sheet-metal assemblies in which the parts must be readily removed and returned to position, has been announced by Elastic Stop Nut Corporation, 2332 Vauxhall Road, Union, New Jersey.

To install the nut, a hole is drilled in the structure and the shank is pressed into the hole. The mouth of the shank is spread against the back of the structure to effect a clinching hold. The knurling engages the drilled surface to assist in eliminating any turning of the nut.



Knurled-Shank Clinch-Type Nut

The nut head is fitted with vulcanized fiber collar, unthreaded, and designed to resist entrance of the screw and to automatically take up all thread play and bring the load-carrying thread faces of the nut and screw into a tight pressure-contact. As the screw thread impresses its way through the collar, the pressure is maintained and increased to a degree designed to prevent the screw from working loose. Resilient character of the fiber collar is intended to make possible removal and replacement of the screw without loss of the locking action.

The nuts are available in a complete range of sizes, thread systems, shank lengths and materials.

Regulators

The Chaplin-Fulton Manufacturing Company, 28-40 Penn Avenue, Pittsburgh, has issued Bulletin 130 describing its line of regulators for compressor control. The device is offered to control pressure at the discharge of a constant-speed pump. When installed in the by-pass from the discharge line to the suction line of a compressor, it is designed to relieve excess pressure by recycling it through the compressor.

Hard Facing

International Stellite Corporation, 30 East 42 Street, New York, has issued three booklets in Spanish comprising selections of a series of hard-facing data sheets. Form 4587, on "Hard-Facing and Hard-Setting Wearing Parts in Oil Fields and Refineries," discusses procedures for application of hard-setting materials to such parts as rock bits, and core heads, and of hard-facing materials to side-tracking mills, ditching machine teeth, pump shaft sleeves, tube cleaners and similar equipment. Form 4586, captioned "Stelliting Steel Wearing Surfaces by the Oxy-Acetylene Process," describes steps in surface preparation, preheating, flame adjustment, depositing Stellite, cooling, finishing and other considerations in applying Stellite by the oxy-acetylene process. Form 4585, captioned "Stelliting Steel Wearing Surfaces by the Metallic Arc Process," describes application by the metallic arc process to typical parts whose service conditions permit application by the process. Subjects include surface preparation, preheating, applying Stellite with the direct-current arc, applying with alternating-current arc, laying a second bead, depositing a second layer, cooling, and finishing.

Gloves

MILLER RUBBER COMPANY

A line of neoprene-coated canvas work gloves in knit-wrist and gauntlet types has been announced by Miller Rubber Company, Akron, Ohio.

The gloves are designed to resist oils, fats and greases, and to offer a tough wearing surface. The knit-wrist glove is wrist length, while the gauntlet type is 14½ inches long, including a 6-inch gauntlet.

Maintenance Engineering Announces Christmas Bonus

Maintenance Engineering Corporation, Houston, has announced a bonus, to be presented before Christmas to the company's 46 employes, based on $2 per month for the period each employe has been with the company, with a $25 minimum. Total amount to be paid amounts to approximately $4500, and ranges to around $300 according to length of service.

Key Company Offers Service On Electric Steel Castings

Key Company, East St. Louis, Illinois, has announced a service for production of electric steel castings, including designing, pattern-making, annealing and rough finishing. The company's plant is also equipped with a modern machine shop for complete finishing of either special or production runs of castings.

Timken Announces $3,000,000 Defense Expansion Program

The Timken Roller Bearing Company, Canton, Ohio, has announced a $3,000,000 expansion program embracing its four plants at Canton, Gambrinus, Columbus and Mt. Vernon, Ohio.

New buildings totaling 184,625 square feet will cost $572,000, with the balance to cover a 60-ton electric furnace and auxiliary equipment, machine tools and maintenance equipment. The program is being undertaken to meet defense requirements.

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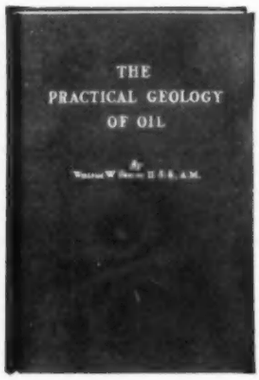
"The Practical Geology of Oil"

By WILLIAM WOOD PORTER, II, S. B., A. M., Consulting Geologist



A new book which will be of special interest to executives, engineers, draftsmen and others engaged in the oil business.

In this book the basic geological principles involved in all phases of the oil business, and apart from the department of the professional geologist, are described in a book short enough to be read easily, non-technical enough to be understood without previous study of geology and complete enough to make fundamental geological processes understandable. No one with a real interest in the oil business should be without an understanding of the geological background. This book is interesting as well as instructive.

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NOTES FOR THE Equipment Buyer and User

provements in aviation gasoline, has now been published in a special oil-industry edition.

Autographed copies of this special edition, which sells for $3 per copy, can be purchased through the book department of The Gulf Publishing Company.

The book is an intensely interesting one, written with a charming style and covers in a non-technical manner all phases of the oil industry.

Homco Cutting & Fishing Tool Has New Headquarters Building

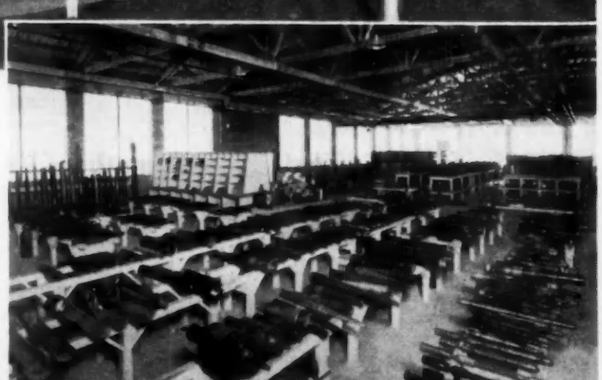
Homco Cutting and Fishing Tool Service, division of Houston Oil Field Material Company, has moved into new headquarters office and shop building at 2101 South Wayside Drive, Houston. The building, containing 15,000 square feet of floor space, is a modern brick structure designed for maximum natural light, and all offices are air conditioned. The location contains 4.7 acres, giving the company ample space for continued expansion.

The modern shop, warehouse room for tools, and office allows the organization not only to do its own repair work, but to manufacture its own specialized cutting and fishing equipment. Manufacture of the company's side-wall sampler and the jack-screw cementing packer is being carried on in the new shop.

Removal of Homco Cutting and Fishing Tool Service division to new quarters does not affect the supply division or the specialty tool sales division of Houston Oil Field Material Company, which remain at 1524 Maury Street, Houston.

Chemicals

The Edwal Laboratories, Inc., 732 Federal Street, Chicago, has issued a 16-page booklet listing its line of chemicals and describing its services. It gives specifications of the chemicals, uses, shipping classification and packing.



New headquarters of Homco Cutting & Fishing Tool Service are shown above, with a shop scene at the right.

Squeaks from the Bull Wheel

In the Same Boat

Judge (whispering before case opens)—Your wife accuses you of terrorizing her.

Defendant—Well, your honor, you see, she always tries to ——.

Judge (interrupting)—I don't care what she does. As man to man, tell me how you go about it.

Diversion

"Now, girls," said the restaurant manager, "I want you all to look your best today. Add a little extra dab of powder to your cheeks and take a bit more care with your hair."

"Why what's the matter?" asked the head waitress. "Butter bad again?"

"No. Beef's tough."

Constancy?

One day a member of the staff in India called on the general and asked for a furlough in order to go home and be married.

"Kenilworth, you're not yet twenty-five. Why don't you wait a year? Then, if you still wish to get married, I'll grant you leave."

The year passed. The officer repeated his request.

"So, after thinking this thing over for 12 months, you still want to go through with it?"

"Yes, sir."

"Very well, you shall have your furlough. And frankly, my boy, I didn't think you possessed such constancy."

Kenilworth thanked him and started to leave. At the door he paused and looked back.

"Sir," he said, "I think it only fair to tell you—it's not the same lady."

Financially Speaking

"Oh, John, do you realize it's almost a year since our honeymoon, and that glorious day we spent on the sands? I wonder how we'll spend this one?"

"On the rocks."

After the Election

Who was it that said: "It's the unexpected that always happens"?

I presume it was some famous political analyst.

What an Imagination

The teacher had recited "The Landing of the Pilgrims." Then she requested each pupil to draw from his or her imagination a picture of Plymouth Rock.

Most of them went to work at once, but one little fellow hesitated, and at length raised his hand.

"Well, Willie, what is it?"

"Please, ma'am do you want us to draw a hen or a rooster?"

Optimistic

A farmer had been to a fair and bought a horse. After stabling it, he gave it some feed. The animal refused to eat. A little later it refused water.

The farmer's eyes gleamed hopefully.

"If only this horse is a good worker, what a bargain I've made."

Love by the Calendar

"Do you love me, darling?"

"You know I do, Harry."

"Harry? My name's Sam."

"Of course! I keep thinking today is Monday."

Skin Game

A boarder bought some sausages and asked his landlady to cook them for his breakfast.

"How'll I cook them?"

"Fry 'em like fish."

The next morning, when the landlady served them, she remarked: "I hope you'll enjoy your breakfast, sir; but there's not much in these things when they're cleaned out."

Women—Woe, Men

A party of visitors was being shown over a large lunatic asylum. The doctor who acted as guide paused before a cell in which a man sat nursing a large doll which was dressed in the gay and gaudy colors of an up-to-date young lady.

"This poor fellow," he explained, "has a very sad history. See how he is bending over that doll and fondling it so tenderly. He spends most of his time like that. He was engaged to a girl of whom he was very fond. She jilted him, however, and married another man while this one lost his reason over the affair."

The visitors were much touched and uttered various expressions of sympathy.

They passed to the next cell, which was barred and thickly padded. "And this," resumed the doctor, "is the other man."

Passing Fancy

"Oh, John—look at that cute little hat in the window. Let's go buy it."

"Yes, darling—right by it."

He Was Used to It

Did you give the prisoner the third degree?

Yes. We browbeat him, badgered him, and asked him every question we could think of. He merely dozed off, and said, "Yes, dear, you are perfectly right."

Don't Need an Alibi

"You don't mean to tell me that you have lived in this out-of-the-way place for more than 30 years?"

"I have."

"But, really, I cannot see what you find to keep you busy."

"Neither can I—that's why I like it."

Simple Arithmetic

There are some singular discounts allowed in the book trade. They were happily illustrated on one occasion by Mark Twain. One day while the humorist was connected with a publishing house he went into a book store and picking up a volume asked the price. He then suggested that as a publisher he was entitled to a 50% discount. To this the clerk assented.

"As I am also an author," said Mark Twain, "it would appear that I am again entitled to a 50% discount."

Again the clerk bowed.

"And as a personal friend of the proprietor," he modestly continued, "I presume that you will allow me the usual 25% discount."

Another bow from the salesman.

"Well," drawled the unblushing humorist, "under these conditions, I think I may as well take the book. What's the tax?"

The clerk took out his pencil and figured industriously. Then he said with the greatest nonchalance, "As near as I can calculate, we owe you the book and about 37½ cents."

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